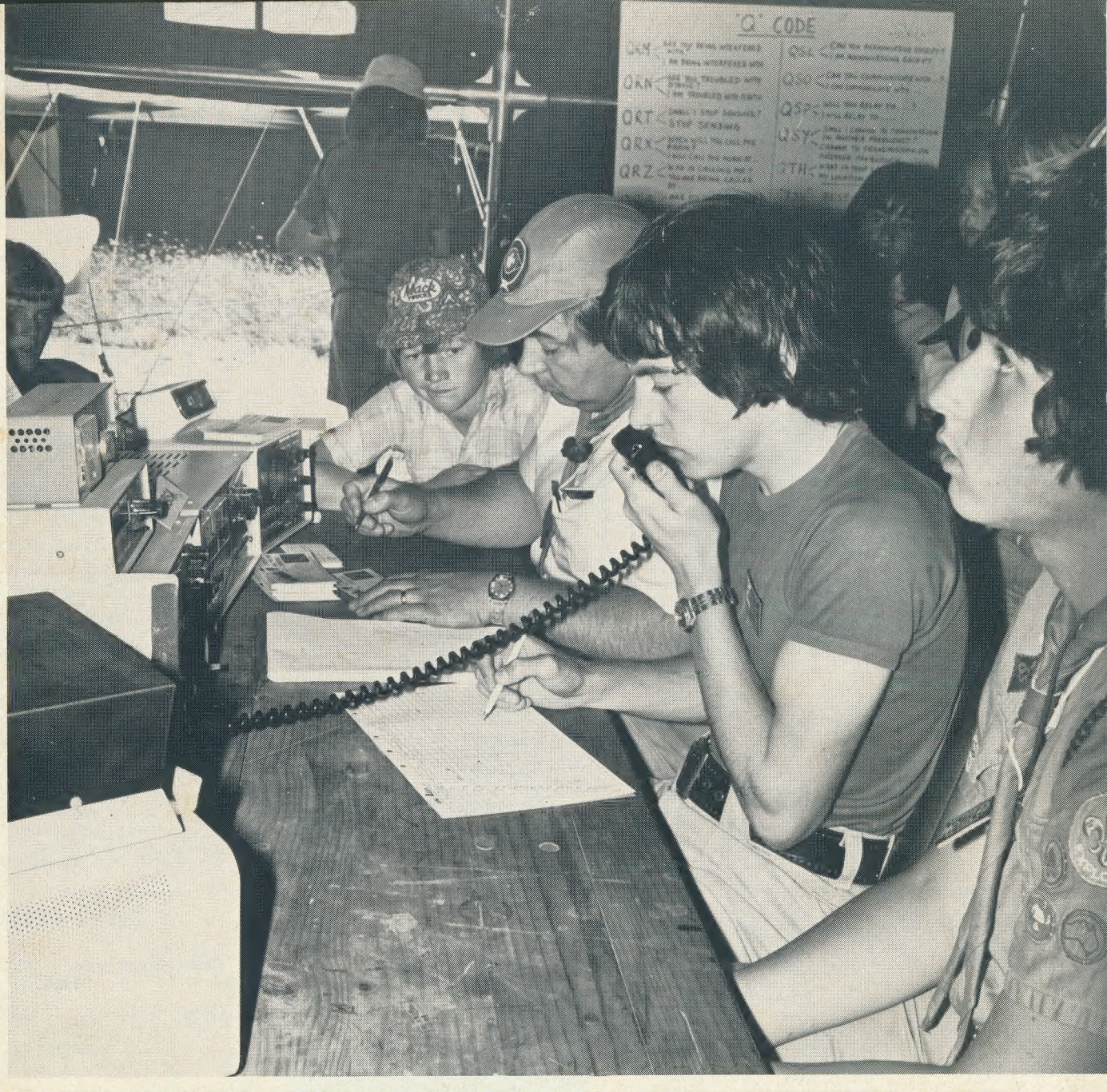
amateur radio



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COVER PHOTO

Popular place for enthusiasts and the interested alike at the 11th Australian Scout Jamboree at Rossmoyne Park, Dandenong, for the first week in January, was the amateur radio marquee.

With several rigs operating at once, it was a busy spot. At the time this picture was taken, the Scouts had made 85 overseas contacts from VK3BSA/Portable.

Pictured, from left: Mike Thorne (VK3ZVN) of Nunawading, an instructor for the Blackburn Scout Radio Club, filling in the cards; Rover Scout Bruce Kendall of 1st Werribee (VK3ZDM) with microphone, and Scout Antony Perri, 14, of 2nd Templestowe, a fascinated observer.

(See page 13.)

Photo by ROBERT L. SUGGETT (03) 267 2316.

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

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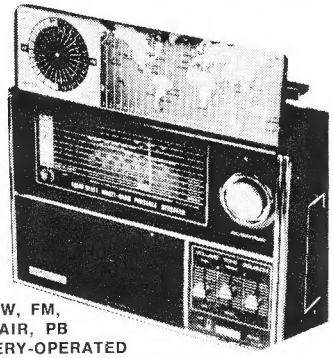

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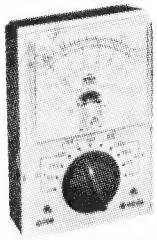

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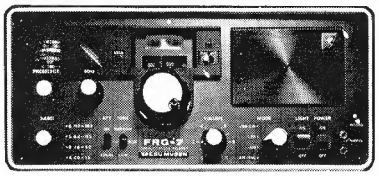

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amateur radio

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QSP WHAT DOES THE "CB" REPORT* SAY ABOUT THE AMATEUR SERVICE?

1. **Radio Spectrum management is a complex matter. It is a limited resource and therefore is controlled internationally. It must be conserved by efficient planning. Australia is a major user of the spectrum.**
2. **No allocations are made without a need being demonstrated. Nothing has been provided for unskilled people for hobby or general conversation purposes (para. 41).**
3. **The Amateur Service exists for those who have a hobby interest. Genuine seekers after knowledge can obtain a Novice licence. The examination syllabus is subject to continuing review to ensure that the standard remains appropriate to the needs of the Service (para. 42).**
4. **The Australian administration is now largely powerless to take action against illegal operators (para. 57). Only 6 of the 148 ITU member countries have a CB Service (para. 59).**
5. **DXing attractive to CB-ers when the skip is right (para. 67). Major difficulty in establishing a CB service using the 23 USA CB channels is that radio amateurs in Australia and New Zealand are permitted the use of the 11 m band.**
6. **Para. 82 states the WIA made strong representations to reserve inviolate all the amateur bands and is opposed to giving up any portion of the 11 m band (NOTE. What the WIA said was correctly reported in WIANEWS in AR for November 1976.)**
7. **As propagation is now poor there is minimum use of 11 m by amateurs for DX. As sun spot cycle progresses 11 m will be used more by amateurs than now (paras. 83/84).**
8. **WIA opposes sacrificing 11 m band (para. 87). (NOTE. See 6 above.)**
9. **A CB Service is not designed for DX operations. The Amateur Service caters for this kind of activity (para. 106).**
10. **Three options were proposed. Modify existing services, use USA CB frequencies or use UHF.**
11. **Amateur radio operators are regarded as responsible users of their allocated frequencies. The service in Australia is largely self-policing (Appendix C, para. 9).**

The Executive.

* **"Report to the Minister for Post and Telecommunications on the Introduction of a Citizen Band Radio Service in Australia" released January 1977.** ■

QSP

SECONDS GET LONGER

The International Time Bureau (BIH) has announced that the rate of UTC (UTC replaced GMT) will be decreased by 1 in one million million on January 1 1977. This is necessary (or so the AR statistician says) to prevent the international clocks being 1 second fast at 20 h 53 m, February 1 in the year 33,665 AD.

PENSIONERS

Please remember that if you wish to apply for regrading as a pensioner this must go direct to your Division. Only the Divisions can approve pensioner rates in respect of their members, so please write there enclosing a photocopy of any appropriate document. Since there could be delays in dealing with applications anyone likely to be affected should pay the appropriate pension grade rate (see January AR, p. 3), if any, to Toorak, to keep AR coming. Unless advice is received that a member has been re-graded as a pensioner the subscription notice for the following year will automatically show a debit for this year plus the full rate for that year.

W. MALAYSIAN REPEATER

MARTS newsletter for October '76 reports that approval has been obtained for their 2m repeater frequencies as 147.9 MHz out, 147.3 MHz in. Work is now going ahead to determine the most suitable equipment. The location is given as Ulu Kali.

NBS RADIO STATIONS WWV AND WWVH

Effective February 1 1977, broadcasts will be discontinued on 20 and 25 MHz from WWV and 20 MHz from WWVH. The 2.5 MHz broadcast from WWV will **not be** discontinued as previously proposed. Services will continue with **no** changes on 2.5, 5, 10, and 15 MHz from both stations.

JOTA

"I have heard amateur operators commenting on air of another problem they seem to be encountering with increasing frequency. This is that Scouters set up the arrangements for the amateur to operate his gear at the local Scout hall and, having delivered his boys to the Den to participate in the event, the Scouter then departs and leaves his members solely in the charge of the amateur radio operator. In one instance an amateur had to leave hurriedly in the middle of a contact to deal with an emergency in the grounds of the Scout den. He could have lost his gear as well as the den in which it was located during the resulting crisis. I believe all Scouters must take steps to ensure that participating Scouts are always under the control of a responsible Scouter, leaving the amateur operator free to concentrate on the job of making radio contacts for the enjoyment of the Scouts taking part." From Report on 19th JOTA to the Scout Association of Australia, which also included sincere thanks to radio amateurs for their contributions to JOTA.

TEACHER'S NOTES

Roger Davis VK4AAR has prepared a most useful and comprehensive set of teacher's programme notes for a one year course leading to the Novice licence. The course is in three stages. There is another course leading to the AOCP. The notes for the elementary introduction to the first course were submitted for publication in AR. Unfortunately they run to some 11 pages and could not be compressed to less than 5 in the magazine. This would be too much as space is at a premium and the number of teachers requiring guiding notes represent a very small number of the total readers.

However, if you, or someone you know, would like a copy of Roger's notes why not write to him at 2/3 Farrington Street, Alderley, Qld. 4051.

AX CALL PREFIXES

Why not use your AX prefix throughout the month of March and therefore gladden the hearts of prefix hunters.

WIANEWS

This month WIANEWS departs from normal reporting and instead, offers you the basic texts of the four segments of Federal tapes broadcast during February.

1296 MHz WORLD RECORD SHATTERED

"Firstly a world record contact — subject to confirmation. This took place on the 23 centimetre band on the morning of Tuesday, 25th January, at 09 hundred hours West Australian time between Wally VK6WG in Albany and Reg VK5QR in Enfield, a suburb of Adelaide.

The approximate distance is 1886 kilometres or about 1172 miles. Wally's rig was on 1296.111 MHz and Reg's about 50 kHz lower in frequency. Wally gave Reg's SSB signal strength 5 readability 4 and received from Reg a 5 4 3 for his CW which was verified later as 5 4 7 because of a tone variation in Reg's receiver. Wally tried AM but Reg could copy only the occasional word because of the passband on his receiver.

As far as can be ascertained the existing world record on this band was set up on 26th October 1973 between WA2LTM and W9WCD over a distance of 1240 kilometres. Official confirmation of this new record will be conveyed to all the major amateur radio societies as early as possible.

Wally's rig was a crystal oscillator on 8000.017 kHz to a 5763/6BQ5/6BW6/832 line up with output on 144 MHz followed by an 832 tripler to 432 MHz and a 3CX100A5 tripler to 1296 all home brewed. The final ran 500 volts at 65 mA, giving 32 watts input and about 10 to 15 W on 1296. The modulator was 807's in AB1. The antenna was a 3 foot dish made up according to specifications in the RSGB's VHF/UHF Manual. The receiver front end was one which came from Ron VK3AKC into a microwave module 1296-281F thence into an FTDX 100.

Reg writes that his gear to generate SSB was an experimental hook-up of the circuit suggested by Karl Meinzer DJ4ZC, in 1970. In this, you process the SSB signal to eliminate most of the distortion caused by tripling. The home-brew 9 MHz signal, mixed to 28 MHz, was fed into his normal home-brew 432 MHz transverter to a 2C39A amplifier and then through a varactor tripler to 1296 MHz. The power output was about 10 W to a 3 foot dish. The receiver was a mixer only converter but he says he did include a pre-amp between it and the converter tunable IF, the 101B receiver.

At both ends of the contact there were participating observers and much of the contact was tape recorded by Wally. It is more than likely that the two observers, Roger VK5NY and Bernie VK6KJ, were themselves green with envy about the contact as Roger himself made a recording at his own QTH but was unable to get his signals through to VK6.

This contact was the culmination of previous contacts on 144 and 432 MHz with all four stations being involved. Reg apologised for the tone reports he gave but said he had dropped the 28 MHz pre-amp in his excitement!!!

The Federal President sent telegrams of congratulations and many members will wish to add their praise perhaps bearing in mind the considerable number of stations further east than Adelaide equipped with 23 centimetre capability. Perhaps therefore the record could be bettered in the near future.

The second item of good news was that replies were received at last from central office on a number of outstanding questions. At least a few gains were recorded. Details will be found in WIANEWS in AR for February.

CB

The issue, late in January, by the Minister of the discussion paper on the future of citizens band radio in Australia should indeed produce a wealth of discussion.

In 1974 the Wireless Institute wrote to the then Postmaster-General expressing opposition to the establishment of a radio communication service for or on behalf of unqualified persons under uncontrolled conditions.

The Minister replied that his Department considered it would not be in the public interest to provide for the operation of a citizens radio service in this country. This was based, he wrote, largely on the experiences of overseas countries on this question.

He also said that the introduction of the proposed Novice amateur licence would help to alleviate the problem. The correspondence appeared in full in AR of October 1974 and listeners are asked to study the wording rather carefully before coming out with comments at variance with the facts.

The Minister assured the Institute as late as March last year that the Government did not contemplate changing the long-standing policy adopted in relation to the operation of a CB service in Australia. Please see Amateur Radio journal for May 1976, page 4.

WIANEWS in the June 1976 issue reported that the Minister had been asked if there was any intention by the Government restrict or prohibit the importation, sale or disposal of the equipment commonly used by illegal operators. Only an acknowledgement was received.

In AR for last November, page 5, WIANEWS reported a further approach to the Minister that if the 11 metre band is withdrawn from the amateur service in Australia Novice Licencees would lose 68 per cent of the frequencies allocated to them. Members will remember that ever since 1972 the Institute has been pressing Central office for the Novice Segment of 28.1 to 28.3 MHz.

Views about a citizens band service reflect quite a variation. Officially there is no policy laid down by the Federal Council concerning the concept of a citizens band service. This was clearly stated by the Federal President in his editorial for the November 1976 issue of Amateur Radio. He said that the Wireless Institute has a duty to look after the interests of the licensed amateur and those who wish to obtain a licence. In this context the well-informed member will have read the views of the Radio Society of Great Britain on CB. These were published in Amateur Radio for November 1976 under IARU News on page 18. Also remember that the Institute has listened to the views of prospective CB-ers. Have a look at the first few paragraphs on page 4 of that AR.

Why quote all this material? The reason is very simple. show the consistency of thought on the subject over quite a period of time and to ask that those who criticize should first inform themselves on the many aspects involved.

One prominent radio club last October passed a motion that the attitude of the Wireless Institute in respect of citizens band operation should be modified and that positive efforts should be made to assist would-be-users in their attempts to secure wider and more legitimate operation in that service.

The club believed that the Institute's stance cannot remain substantially neutral. Ultimately, the writer said, the Institute will have to come out either for or against the aspirations of would-be citizens band users. In terms of future Institute membership it seemed to them more pragmatic to foster alliance with CB users than to oppose them or ignore their existence. It was pointed out that if CB became a reality a CB Association would be formed which would wield considerable influence. It was then asked if it would be any sacrifice if the Australian Amateur Service gave up its 27 MHz allocation to CB users.

The memorandum ended with a reference to a book clearly describing the demise of people and organisations who refuse to acknowledge change or who refuse to accommodate change. They end up as vegetables.

Another influential club adopted as official club policy that the CB service may be inevitable and agrees with the principle of a licensed CB service and supports its introduction. Their policy stated that the amateur should press for an increased allocation on other HF bands as compensation — preferably in the 160 and 40 metre bands — and that Novice operation be permitted on 10 metres and also on 160 metres if this band is extended.

Another group recommended the voluntary abandonment of the 11 metre band by amateurs in favour of a CB service.

Not too far distant, geographically, another influential group addressed the Minister on the lines that the introduction of CB on 27 MHz into this country would be a disaster and something the Government would live to regret. They wrote that there is no justification for this type of service into Australia as any person requiring communication is well catered for independent of his or her particular vocation. They pointed out that if pressures win out, many amateurs may well wonder if all their study and effort has been worthwhile or indeed necessary. They recommended that the present policy of not legalising CB operations should continue, but if this is beyond the Government, due to pressures by commercial financial interests, then the assignment of a part of the UHF spectrum should be granted so as to ensure restricted range and restricted usage by reason of extra cost. It is also stated that the Department has not and could not enforce any requirements because of staff shortages.

This group, and others, point to the development of open confrontation between licensed services, including amateurs, and the present illegal operators on the 27 MHz band who have in some cases threatened physical violence to legitimate users of the band.

One or two individuals and groups have done their utmost to have the amateur case, as they see it, published by the media. They have not been particularly successful.

One writer wrote that Government and Departmental procrastination and the slow processes of the law, have allowed the situation to develop almost to the point of no return. He refers extensively to the chaotic situation in the USA which must not be allowed a foothold in Australia. Other writers pointed out the relationship between the Novice programme and CB activities. One wanted vigorous Institute reaction to the CB threat and thought that Communicator licences — a 4th grade amateur licence — would be the answer, by absorbing the better types of pirates, he said. We must have dialogue with CB-ers he thinks.

Another club letter asked whether the Wireless Institute should concern itself with such a thing as the allocation of frequencies to the Diplomatic Service or other commercial users. They believed the WIA would be doing a disservice to licensed amateurs by taking part in discussions about CB licensing. Such matters, they said, do not affect amateurs unless their frequency allocation is threatened. It is a political matter of no direct concern to us, they say. An official opinion, on such an emotional issue as CB radio, should be avoided, as taking either side is bound to alienate some section of the community they said. Their view is that the allocation of the 11 m band to Novices appears to be a disaster.

In all the flow of words on the subject very little seems to have been missed. Interference to other services, TVI and FRI of all kinds, the Australian position in relation to international obligations, Australian credibility at ITU conferences (beware WARC 79 it is said), the proliferation of sub-standard equipment, what percentage of present illegal operators would licence themselves and what happens to those who don't, what about all the other services using the 27 MHz band apart from ourselves, controls over third party traffic, the outward spread or migration of illegal operators out of an assigned band for purposes of overseas Dx on high power in one form or another, the welfare of the nation in trying to close down, in any National emergency such as a world war, an illegal service which does not exist, false accusations that it is the amateur service which creates interference or that only such and such a service can provide proper emergency communications.

And so the list expands and expands. The right of the individual to have access to the frequency spectrum, the ready availability of suitable equipment, the cost factor and so on.

Finally we return to the Government's discussion paper which sets out three options for legislation. One — introducing a CB service similar to the one in the USA. Two — introducing a CB service on UHF. Three — modifications to existing services to meet genuine community demand for radio communications.

At this stage it seems clear that vociferous elements will opt for the USA type of service on 27 MHz, which is similar to those in use in Canada and West Germany. The only other countries in the world which are known to possess a CB service are New Zealand — 75 kHz either side of 26.5 MHz — and Japan — 21 MHz band.

The lobby is expected to intensify notwithstanding the costs to the community as a whole and the alleged disenchantment of many in higher places who seemed quite keen about such a service only a short time ago.

What advice can we give? No problem. Join the Wireless Institute of Australia and study for an amateur licence. If a CB service comes into being some time in the future you will have trained yourself to become a more discriminating participant in radio communications."

POSTAL MOTIONS

The two postal motions, 76.20.02 and 76.20.03 (see Jan. '77 AR, p. 4) listed in WIANEWS, were both adopted. ■

WIA EDUCATION

THE ELEMENTARY RADIO COURSE by Roger Davis (VK4AAR), Fourth edition.

This publication is intended to provide an introduction to electricity and radio for the beginner. It forms the first part of the Queensland Amateur Radio "A" course. The 43 typed pages cover electricity and magnetism, radio reception and transmission, plus practical details on constructing a crystal set and a one transistor radio. The text is clear and easy to read. The necessary theory is adequately explained without the use of misleading analogies. A commendable effort.

Incidentally, the "A" course which is sponsored by the WIA Qld. Division and the Windsor YMCA also includes the Intermediate Radio Course by L. Whyte, Novice AOCP Study Guide, parts 1 and 2, by R. Davis and Introduction to Morse Code (cassette) by R. Davis: all for $15. Individual texts such as the one reviewed here may be obtained from the Education Officer of the Qld. Division of the WIA, Box 638, G.P.O., Brisbane 4001.

ERC will be available separately direct from Roger Davis, 2/32 Farrington Street, Alderley 4051 — $1.20 includes postage.

THE ADVANCED RADIO COURSE — A STUDY GUIDE FOR THE AOCP. First edition January 1977. Written and compiled by Roger Davis and Trevor Thompson.

After having completed the "A" course (see review of the Elementary Radio Course) and presumably thus obtained a Novice licence the student may obtain this study guide for only $4. It is a very comprehensive study guide which makes reference to two text books only. The course can be completed in 26 weeks. The knowledge required to pass any AOCP paper may be obtained almost painlessly by following the guide. All necessary topics are covered without undue effort being expended on peripheral areas yet the treatment is most thorough. Chapter one lists a syllabus for the AOCP. Chapter two is the study guide itself and covers the theory in 15 sections. Each section lists the relevant paragraphs of the text books plus the time (1 to 3 weeks) for study. To test the depth of knowledge gleaned each section concludes with a set of questions. Chapter three contains the answers to the sets of questions. Chapter four contains past AOCP papers and chapter five gives sample answers.

The guide is well compiled and any students following this guide would be virtually guaranteed an LAOCP pass.

Recommended for Novices and other aspirants. VK3AFW. ■

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Peter B. Dodd, VK3CIF
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Here is something different — a lot of travel with a little bit of amateur radio.

GD3PBD, YA1PBD, OE1ZBW, ETC., ETC., ON SAFARI

Some years ago — long ages it seems — we were living on the Isle of Man. Right in the middle of the Irish Sea; operative as GD3PBD. Not a very good place for working DX because of the extremely hilly terrain and a house without a garden but tall enough to sling a multi-band dipole from the roof ridge down to small shrubs front and back. The "little people" were kind enough to us, attendance at the regular meetings of the radio club, exploration trips round Ellen Vannin, practising Manx Gaelic, learning the local history, watching parts of the Isle of Man TT races, taking the kids on the horse trams and many other pleasant diversions kept us active. No population pressures except summer tourists, but plenty of windy wet winter days and the low cold cloud associated with so many of the Western Isles — once under the rule of Tynwald.

I suppose the years of service postings here and there around East Africa had made us into wanderers. So it turned out sooner than later that a decision was made to emigrate to New Zealand. In three months all was made ready to travel overland since air travel for so large a family was too expensive now that we had to pay the bills ourselves, and sea travel was too booked out for years ahead so it appeared. The paper work involved was fantastic.

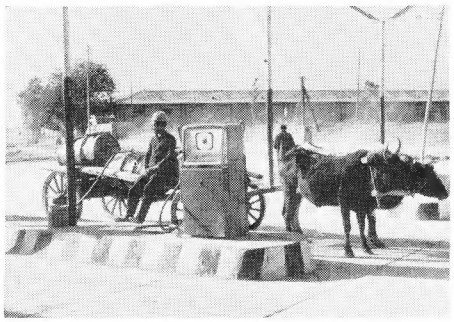
Great care was taken with mounting the KW2000 transceiver inside the motor caravan but a mistake was made in mounting the mobile whip on the baggage trailer. Only during the happy lazy weeks in Singapore did the opportunity and parts become available to mount it on top of the caravan. Thereafter the DX started rolling in.

Special pains were taken about a suitable little generator but it really was a noisy beast. Essential however for supplying mains voltage for lighting as well as power for the rig, heaters and fans. The rating was 240V at 800W and seldom was it found wanting. In some places we had 3 inches of overnight snow on the roof. In other places we ran through pre-monsoon heat over 130°F, minus a windscreen accidentally broken near Lahore but irreplaceable on the sub-continent. When you plan to travel self-contained, more or less, through almost unknown primitive countries, it really is amazing the things you find must go with you. A total of 3 tonnes sounds a lot. A small sealed carton of toilet-rolls stacked on the back seat of the little sedan we took with us nearly landed us in big trouble upon entering Yugoslavia from Austria. I had gone through Customs first in the caravan and the XYL followed in the car. All seemed well but as she was about to drive away, an armed frontier guard menaced her with his rifle and demanded to know what was in the carton. Since he spoke no English, and we had mainly English and a now useless Ki-Swabili, it took time to figure out what he wanted. Fortunately the opening of the carton, and the sheepish production of toilet rolls from within, brought a big grin over his face and we were waved on.

That was where, of all places, I was sure we would have trouble with the rig and had taken the precaution of having it included in the carnet for the caravan. It was slung up inside in full view but received no attention whatever to our great relief. As it turned out we had no trouble with it upon entering all the 17 countries we passed through, except here in Australia, where carnets were not recognised and masses of paperwork had to be signed. The little rig performed faultlessly throughout. Many enjoyable QSO's were had, especially in this part of the world, despite its "innards" being clothed in layers of dust from the Nullabor back to Iran.

What a far cry it seems to the camp site on the shores of a dam outside Kabul where the DX was hard to work and the only safe water to drink came from the American embassy well in the city. The activation of YA1PBD made me a member of the Camel Drivers' Club but I guess all of us could have done without Afghanistan. A dedicated non-tourist country where the petrol was little better than kerosene and your local currency needs could economically only come from the black market. Where the mountain scenery was magnificent but the deserts harsh and forbidding. Where there were more official road barriers than anywhere else, including bandit barriers of sharp stones across the road. Where you learned very quickly to maintain a firm grasp of your money until your change could also be firmly grasped. Where students riot, tanks and armoured vehicles required negotiating with the utmost caution. What a relief, and a thrill too, to motor safely through the famous Khyber Pass — the land of the wild hill tribes — into the sub-continent of India where I had served a spell of duty back in the 1940's.

Should I have obtained reciprocal licences before setting out on the journey? Unfortunately in those days only a few



FILL 'ER UP!

would have been obtainable and then only by personal application to cut delays. In the Asiatic countries there was, and still is, little hope of a foreigner obtaining amateur licences let alone reciprocal visitors' licences. Apart from this the winter in Europe was still with us when we set out thus we made no really lengthy stops until reaching Vienna. It was mouth-watering to be in Liechtenstein without a licence. Perhaps we might have needed radio communication during the many hours slowly inching forward through a blizzard in Switzerland knowing full well the hundreds of metres drop if you strayed off the "road". Anyway it was a pleasure to spend a few quiet days of sightseeing in Vienna by day and operating as OE1ZBW by night.

Listening on the bands whilst in Athens was a severe temptation to indulge in a little pirate activity. The military situation at the time and the advice of George, SV1AB, dictated that discretion was perhaps the better part of valour after all. We wasted little time in crossing Turkey — mile after mile of mountain passes with rotten dirt tracks the further east we travelled. Snow was still on the mountains but the roads were mainly clear as it was early spring by that time. Viewing the beautiful lofty white cone of Mt. Ararat was little compensation for the hours detained the same day at the Turkish frontier post overcoming a graft-hungry Customs officer without smoothing his palm.

Perhaps I should have applied for a licence in Teheran, but we had few thoughts at that time beyond resting a while and preparing for the tougher journey ahead. Another visitor in the same caravan site was Larry Pace, a W6 and his XYL. The magnificently scenic road from Teheran to the Caspian Sea and a dip in its waters did us good after the dust of the capital.

There was no hope of getting licences in Pakistan and India. The former because our road transit pass was only for four days and the latter because our stay in New Delhi was cut short by the need to reach Madras in time to catch the ship to Singapore. Yes, we visited the beautiful Taj Mahal, Akhbar's tomb and many of the other tourist sights of Agra, Gwalior and other historical places. It was a pleasure to meet and address a meeting of amateurs in Madras struggling so hard in the face of poverty (general) and a shortage of everything.

The lazy voyage across the Bay of Bengal and the delights of being in "civilisation" once again in Singapore set us back on our feet. I tried for a licence in Singapore but the delays involved and being merely a visitor finally beat me.

The very day after arrival in Fremantle saw me walking out of Cable House in Perth with my VK6CIF licence! This later changed to VK5CIF, VK3CIF, VK1CIF and finally VK2CIF as we motored leisurely across the Continent. We are truly grateful for the magnificent hospitality shown to us in so many places by friendly amateurs and old friends. We even had a solid 5 x 9 QSO with old friend Robby 5Z4ERR, from the caravan park in his son's garden in Adelaide.

The trip over to New Zealand was uneventful and ZL1BDC was activated for a few days precisely one year (for Customs purposes) after setting out from the U.K.

How come I came back to Melbourne? Well, that is quite another amateur story which really began during an amateur cocktail party in Singapore.

If you travelled this route today you would find that reciprocal licensing arrangements for visitors much easier in Europe as long as you possess a G licence. You would find 2m and 70cm repeaters in use almost everywhere but you would need 40m or 80m or even 20m for longer hauls although the first two of these bands are very noisy with QRM and QRN.

The position in Asia is virtually unchanged except that amateur radio is now banned altogether in Afghanistan.

Meeting amateurs in Europe is somewhat difficult unless you have the addresses of old friends, recent copies of local amateur magazines and a working knowledge of the language. You could travel through city after city without even seeing an amateur's beam because there are bigger and taller trees about the place. Even if a beam might be visible from the road it could be almost totally hidden from sight behind the double-storey houses.

Many years earlier we had shown hospitality to a visiting couple who turned up at our house one evening in Malawi during their cine film-making journey through Africa. It was an unanticipated and unexpected pleasure therefore for us to drop in on them unannounced at their country retreat on the eastern side of Lake Constance. Walter DL9HF and his charming XYL (also a licenced amateur) were as surprised to see us as we were to become snowbound the next day in their garden. It is visits of this nature which are of the greatest benefit to host and guest alike. Visits "cold" — that is to say, without least prior "on air" contacts — are seldom so satisfactory. In the same way it takes time to achieve a thawing of the atmosphere if you, as a stranger, attend a local group or club meeting without first being known to one of the members.

Nearer to home I think, VK5ZX, VK3AHR, VK1JF and VK2GN will know exactly what I mean. Some amateurs derive great pleasure in welcoming visiting amateurs but despite the "bonds of fraternity" in amateur radio there are many who take a different view. Since this applies universally and not solely to Australia, it behoves the visitor to be cautious and tactful when he is overseas. The stranger in your midst might be seeking a pleasant evening in a friendly atmosphere. More often than not he does not want to borrow money, run off with your wife or steal anything loose lying around the place. If he does, throw him out, quick. ■

BURGLAR-PROOF YOUR SHACK

Ed Manifold VK3EM
267 Jasper Road, McKinnon, 3204

Hearing of the loss of further radio equipment on a recent Sunday morning broadcast, and having had an attempted burglary here late in May, together with other thefts of amateur gear in recent months, it looks as though the pattern is becoming more prevalent, and while insurance can compensate in part for the lost equipment, the unhappy experience of a breaking and entering by the thief remains for many years after.

Having experienced this, it was decided when going overseas in 1974, that the installation of dead latch door locks on all external doors, and a good alarm system was the first line of defence against a repeat of this event.

In general there is no house, shack, garage door or window which cannot be protected by one means or another.

Probably the best for door and window openings are concealed reed switches and magnets fitted into (or on to) surrounding frames, with micro switches as a second choice, wired with 22 gauge Bell or jumper wire concealed in mouldings and walls, while fixed windows can be protected with metallic tape.

It may not be acceptable to put metallic tape on front windows from the XYL's point of view, but as these windows are usually covered by Venetian blinds or drapes, and would have to be disturbed by a would-be thief, cords across the blinds or drapes, could be attached to magnets and reed switches, which the slightest movement would actuate.

Roof spaces can be actuated where necessary with fine gauge trip wires, contact plates or other circuit breaking devices.

Even the "Loo" louvre windows, fixed or moveable, can be protected with metallic tape or fine trip wires.

The system which seems to be most favored these days is the closed circuit continuously activated transistorized control.

While the circuit is activated the current requirement is very low, being of the order of 2 mA at 12 volt supply, which from 2 lantern type batteries means a long life, almost equal to shelf life, and if only used as back up supply to an AC power supply, could equal shelf life. Refer to Fig 1.

These days all the necessary "Black Boxes" for control and amplifiers are available from your friendly radio parts man, and even at current prices the cost is cheap, as compared to the loss of that "Black Box" transceiver, but the junk box has usually a goodly quantity of the necessary parts to construct a reliable alarm system, and we would not be amateurs if we did not like constructing something useful, and at present, looks to be a necessity.

For reliability it is suggested that the following points are mandatory:

1. A.C. and battery power supply.
2. Operational at all times, day and night.
3. Well concealed locations for, Unit, Speaker, Switches and Wiring, to prevent premature de-lousing by the would-be thief.

The inclusion of push-button switches in series with each key operated door switch, Fig 2, provides protective alarm "Panic Button" should the need arise for the XYL, against the forced entry of any undesirable type of caller.

The system could be extended to include smoke or fire detection sensors, and no doubt other uses would suggest themselves where needed.

One additional control which would be desirable for inclusion (not shown) is that of a "Time-out" circuit after a period of operation, as it has been found that the wailing siren doesn't find much favor with the neighbors after the first few minutes, while they are waiting for the Police to arrive to investigate the cause of the alarm.

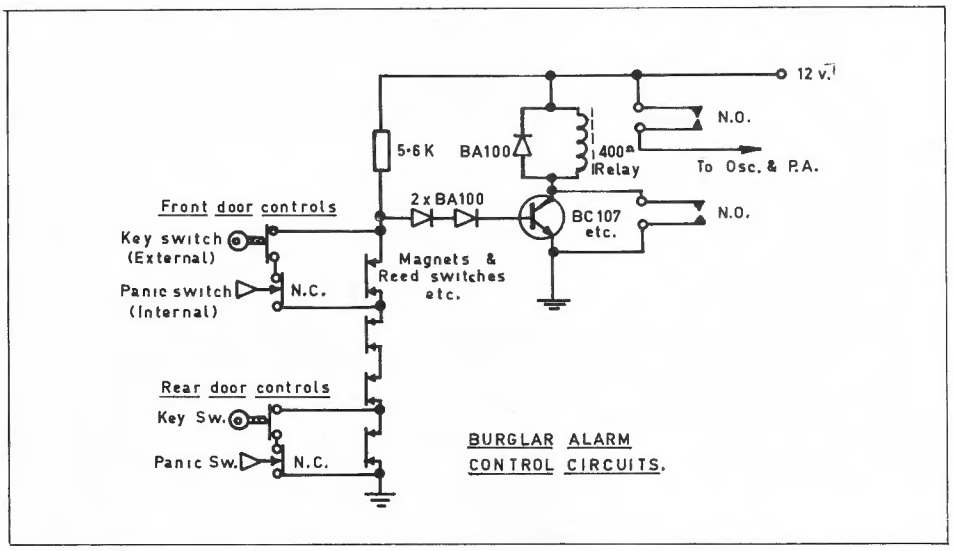


FIG. 2. IMPROVED CONTROL CIRCUITS

Suitable time-out circuits are available commercially.

When away on holidays, or for an extended period, a key should be made available to a neighbor, or to the local Police, in a sealed envelope, with instructions where the alarm control is situated and how to shut down the system, together with address and phone number, of who to contact in case of building damage by forced entry.

In my own installation an internal speaker is switched into circuit while setting and testing all sections, and when found operational the external speaker is switched into circuit so that when all doors are locked and key switches activated the system is in "GO" condition.

By preference this article should not be necessary for "AR", but the thieves and parasites have turned their attention to hard earned, and in some cases pensioner owned equipment, and while my own equipment is always with me when I am away, I have been thankful that the alarm system has deterred one known attempted burglary while away, as my son said after taking the phone message, "you will be pleased to know that your alarm system paid for itself in full last night". I hope it can do the same for you!"

Acknowledgements:
Electronics Australia

A Reader Built It — October 1969. P. 98 Control circuit & power supplies.
Eastern & Mountain District Radio Club Project — Basic U.J.T. Alarm.
Fairchild Australia Pty. Ltd.

App. brief A.004 Economic Amplifier 3.5 watt.

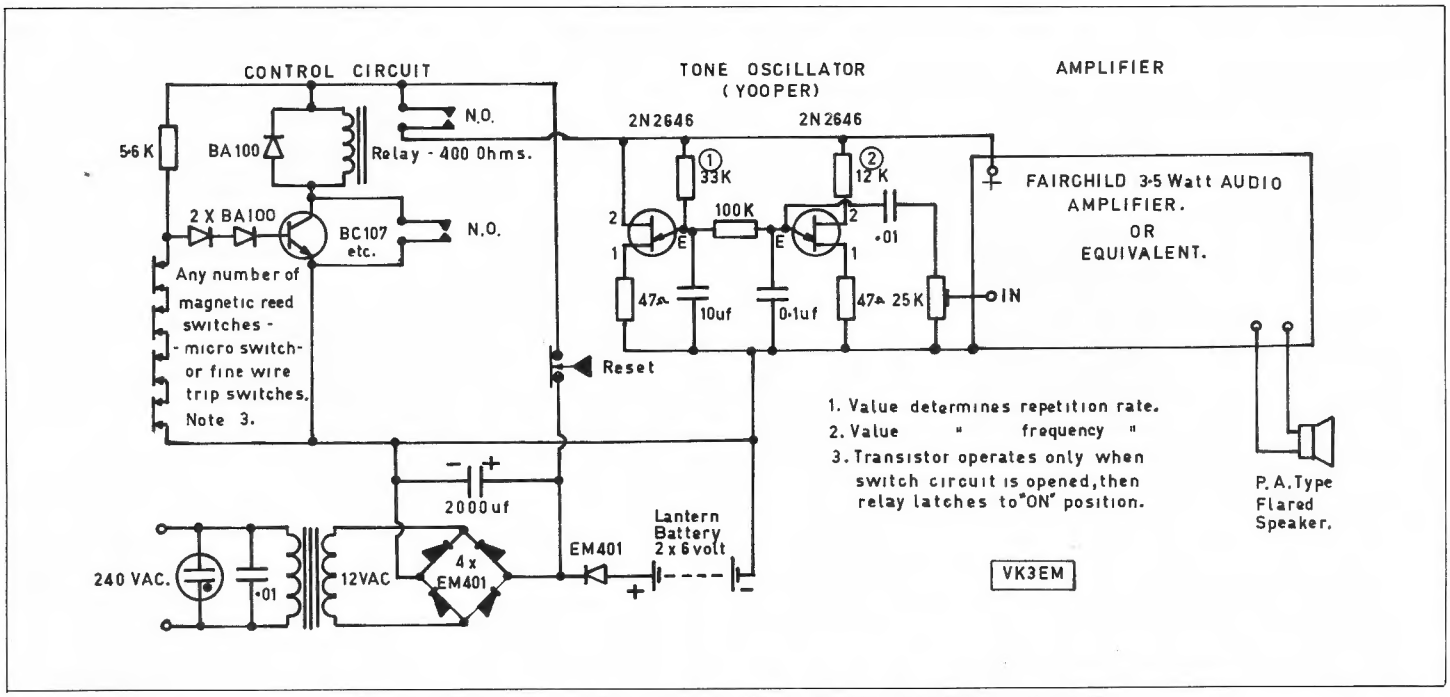


FIG. 1. BURGLAR ALARM CIRCUIT WITH BASIC CONTROL CIRCUIT

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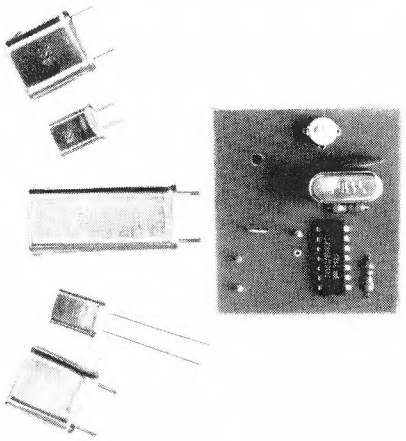

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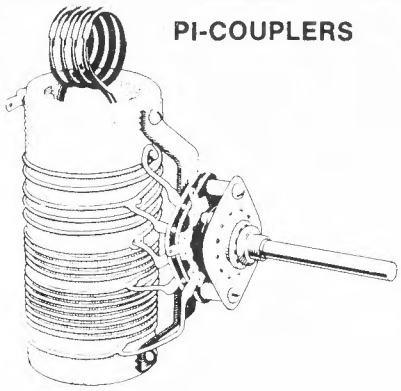

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A SIMPLIFIED METHOD OF ANTENNA TRAP CONSTRUCTION

Ivan Huser, VK5QV
40 Flinders Ave., Whyalla, Stuart, S.A. 068

This article describes a simple method of constructing a higher performance antenna trap with the advantage of low cost and easy tuning.

Trap dipoles provide multi-band operation with a minimum of complexity. Compared with paralleled dipoles, the trap dipole is neater, uses less material and takes up less room. Unlike atennas using tuned feeders, it of couse needs no tuning unit.

Many articles have been written about the trap dipole in its various forms, and it is not proposed therefore to go into the details of its operation. It would appear that the main problem associated with the construction of this type of antenna, is the manufacture of the trap itself. Assuming a suitable high voltage capacitor is available, the process of tuning the trap around a fixed value of capacitance is often tedious and time consuming. The VK5QV trap uses an inductor wound with hook-up wire and a capacitor made from a short length of coaxial cable with good results.

A suitable L/C combination to resonate at say 7080 kHz is approximatey 10.75 uH of inductance and a 47 pF capacitor. The *exact* value of inductance is not important, since the capacitance can be readily varied to bring the circuit to resonance, thus making this type of trap an attractive proposition.

The original trap was wound with 19 turns of 7/.0076 PVC hook-up wire close wound on a 1¼ inch diameter former which also acted as the strain insulator. Suitable material for the former is readily available in the form of PVC electrical conduit (1¼ inch class B) or PVC pressure pipe (25 mm) of the type used extensively in plumbing.

The capacitor is made from RG58AU or RG58CU 50 ohm coaxial cable. RG58CU cable uses a non-contaminating sheath and is therefore to be preferred. Data sheets on hand for these cables gives a capacitance of 30 pF per foot. The necessary length of coax to give 47 pF can easily be calculated thus:

$$12 \text{ inches} \times \frac{47}{30} = 19 \text{ inches}$$

This is the *approximate* length of coax required, but in practice, a slightly greater length should be prepared and subsequently pruned to bring the trap to resonance at the desired frequency.

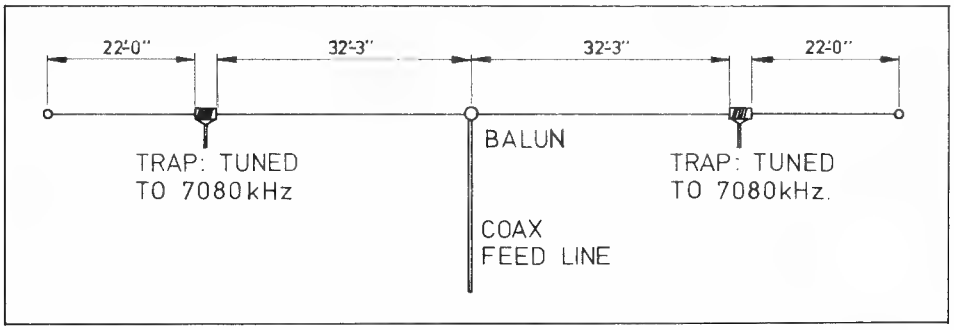


FIG. 1. ANTENNA DIMENSIONS.

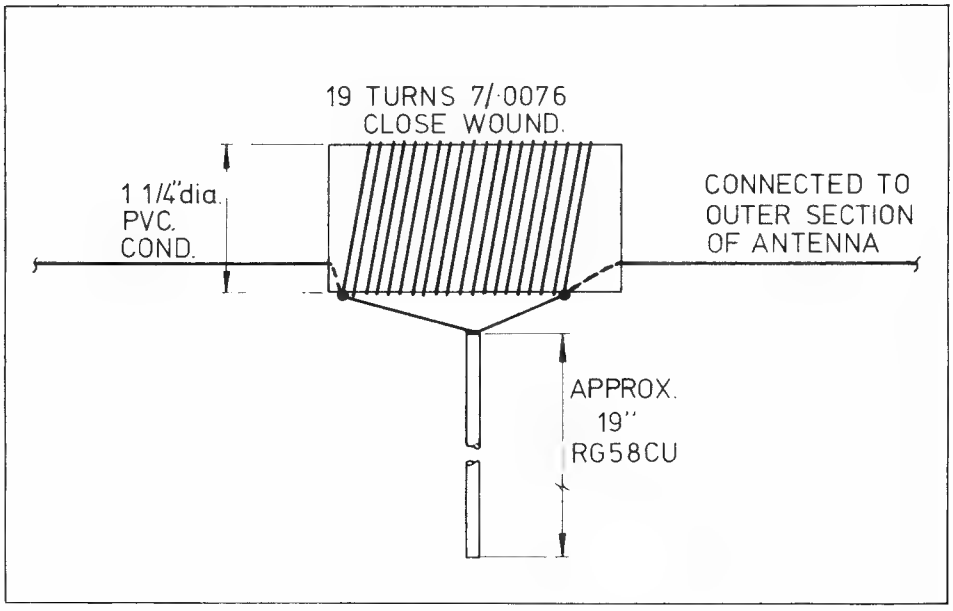


FIG. 2. TRAP DETAIL.

With an inductance of 10.75 uH, a variation of capacitance from 46 pF to 48 pF is all that is necessary to cover the 40 metre band. It can be seen therefore that the pruning of the coax should be carried out with care. Notwithstanding, tuning can be achieved accurately in a very short time. When tuning is completed, both ends of the coaxial capacitor should be sealed with a suitable material such as epoxy resin to stop the ingress of moisture.

It has been found that this type of capacitor tends to "load" the antenna to some extent. Thus different antenna dimensions to those given in articles on trap dipoles using conventional traps, will most likely be required. It would appear from the results obtained from experiments using this type of trap, that part of the antenna connected to the braid of the coax capacitor will be most affected. By connecting the braid to the inner dipole as shown, the length of the 40 metre dipole will generally be shorter than usual due to this loading effect. It can be seen therefore, that the outer section of the antenna will now have to be lengthened to resonate on 80 metres.

The approximate dimensions of the original antenna are given as a guide, but it should be remembered that the final dimensions may vary somewhat with each installation.

Very good reports have been received on 80, 40 and 20 metres since this antenna has been installed, so if you are looking for a simple multi-band antenna, may I suggest you give it a try — you may be pleasantly surprised.

REFERENCES

The ARRL Antenna Book. ARRL.

Trap Dipole for 80 and 40 Metres. Amateur Radio, Sept., 1975.

Coaxial Cable Catalogue. Acme Engineering. ■

RADIO TELETYPE

PART THREE

Jostein Gjerde, LA7MC

RECEPTION OF RTTY

Now that you understand the basics of teleprinter operation, this article will gently introduce you to reception "off air" of RTTY signals. Firstly, however, your machine must be set to the right speed. Here is how it is done.

In this country (Norway) most amateurs get their teleprinters from the Telegraph Co. which regularly — and normally long before the machines are completely worn out — change over to newer models which come on the market. (A similar situation exists in Australia although many of the machines available have come from overseas sources — Ed.).

This means that amateurs normally get outdated machines. When you come into possession of a machine there are a few things you must check before setting up operation as an amateur station.

The first is that you must regulate the speed such that it equals 45 baud used by amateurs instead of 50, as the machine is set for Telegraph service. For speed adjustment, the machine should be equipped with a so-called stroboscope field round the motor axle. This field is divided into alternating black and white sections, usually 10 of each. While the motor is running, if you observe this field through a peep-hole in a tuning fork vibrating at 125 Hz, it will appear that the field is stationary if the motor is running at the right speed to give 50 baud. If you now make a new field, divided into 11 black and 11 white sections, you can set up as above and thereby alter the machine to 45 baud. (A strobe lamp operating at 125 Hz could be used. — Ed.).

The other thing you must check before operating is the margin searcher. This comprises of an adjustable scale on top of the machine. The scale has either 100 or 200 divisions.

The important thing is, you should be in the middle of this scale with the indicator.

As mentioned before, the live sections on the receiving cylinder are narrower than on the transmitter cylinder, so there is room for a slight discrepancy in speed.

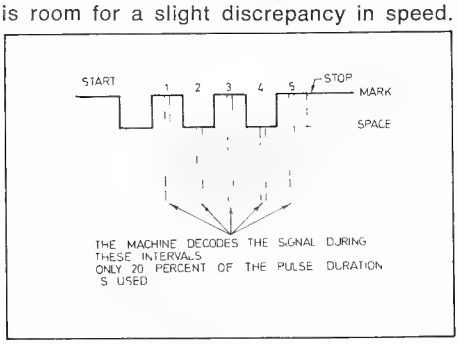


FIG. 1. TIMING DIAGRAM FOR MACHINE DECODING OF A SIGNAL

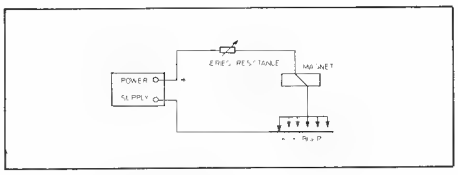


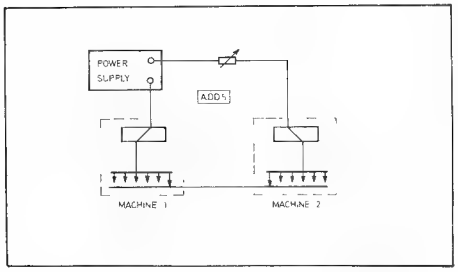
FIG. 2. LOCAL LOOP CIRCUIT

This means that the receiver makes use of only part of the transmitted mark and space pulses. The receiver, in fact, only 'sees' about 20 per cent of the transmitted signal (see Fig 1).

What you do with the margin searcher, is in fact just to move these peepholes in relation to the start impulse — this also applies to signals sent from your own keyboard. The peepholes are placed so that, as close as possible, they come in the middle of the transmitted signal as they are shown in Fig 1.

You will therefore, within a relatively large adjustment range on the margin searcher get a useable type. If you want to check the adjustment, you can wire the machine such that, the receiver magnet receives current through your own keyboard (the local loop Fig 2). You will then get printout. When you move the margin searcher to and fro on each side of the mid point, you will come across two limits where the machine begins to type errors. When you have found these two points, you can set the margin searcher to the middle value and let it remain there.

FIG. 3.



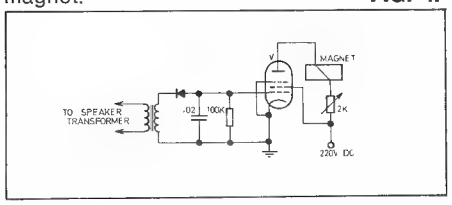
CONNECTION OF TWO MACHINES

If you pass current through the motor without it passing through the receiver magnet, the machine will run continuously. It is useful to couple up a local loop as shown in Fig 2. You then get print out and can begin to practice sending to yourself.

If you have two machines you can couple these as shown in Fig 3, and therefore have set up a Telex. You can easily see that the receiver mechanism will run continuously without current to the magnet. The no current state is the same as a space signal and this is just a message to the receiver cylinder to start searching.

Most radio amateurs will rather be interested in getting the machine connected to a radio receiver so that they can receive radio teletype signals to operate it. For this they need a so-called radio teletype converter or demodulator. This is often called a TU (terminal unit) and is connected between the receiver and the teleprinter and converts the two tones to keying of the current through the receiver magnet.

FIG. 4.



SIMPLE RTTY DEMODULATOR

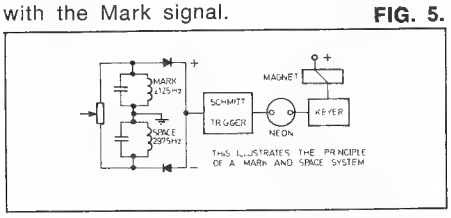
A very simple type of TU is shown in Fig 4. Valve V is an ordinary pentode which is capable of carrying the magnet current, about 45 mA for a Siemen T37 with the magnet poles in series (e.g. 6AQ5 — Ed.). The series resistance is adjusted to this current when there is no received signal input.

Transformer T is an ordinary output transformer from an old radio. It is connected "back to front", i.e. with the voice coil winding connected to the station receiver's output.

When a signal is received, that is transformed up and rectified so that it creates a large negative blocking voltage on the valve's grid. This will cut off the valve so that the magnet current ceases.

When you wish to use this converter for receiver radio teletype signals, set up the receiver so that it is in 'zero beat' with the Mark signal.

FIG. 5.



PARTIAL SCHEMATIC FOR RTTY CONVERTER

The tube is now without bias and passes the full current, as it would with 'Mark'. When the 'Space' signal comes, we get a tone of 850 Hz in the loud speaker. The tone is rectified by the diode, this increases the blocking voltage and the magnet current stops. We thereby get a break in the relay current for a space signal. With this simple arrangement you can get good results, particularly if you have a receiver with good selectivity.

However all signals coming from the loud speaker will produce rectification and blocking, and you may well ask how this will cope when QRM is received. You will soon see the need for a converter which

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makes use of both mark and space signals. Fig 5 shows a scheme for such a coupling. We have here two resonant circuits which sort out the two tones and rectify the signals such that a mark signal gives a positive voltage and a space signal gives a negative voltage. A Schmitt-trigger will now change this combination signal into an on/off keying which will operate the mechanism via a neon coupled keyer. You can see that this is the basic principle of most more complicated converter systems, but there are all the subtleties and they are such an extensive subject, that they need an article of their own.

(to be continued) ■

BOOK REVIEW

PRACTICAL ELECTRONIC PROJECT BUILDING by Alan C. Ainslie and M. A. Colwell. Published by Newnes Technical Books. Review copy from Butterworths. Chatswood, N.S.W.

This book of over 100 pages is one of six in a series for the home constructor and appears to be the best of the series.

A concise guide to sound construction techniques is given. Topics covered include: tools, components, kits, layout, wiring p.c. boards, metalwork and cases, finishing, testing and fault location.

The book is liberally illustrated with clear drawings and photographs. At about $4 it is definitely recommended — perhaps as a gift to that nephew (or uncle) starting out as a do-it-yourself electronics expert.

VK3AFW.

PRINTED CIRCUIT ASSEMBLY by M. J. Hughes and M. A. Colwell. Published by Newnes Technical Books. Review copy from Butterworths, Chatswood, N.S.W.

Another volume in the series for the home constructor, its 90 pages contain much information for the beginner. The OT "chassis basher" will also find much to lighten him. The techniques involved in producing your own printed circuit boards are well covered except for one unfortunate omission. Photographic development of p.c. boards is not dealt with at all. Topics that are covered include analysis of board materials, layouts from circuits, processing, assembly and some supplementary data.

Useful for the inexperienced. VK3AFW. ■

QSP

TELECOM 79

The 3rd World Telecommunication Exhibition, Telecom 79, organised under the auspices of the ITU, will be held in Geneva from 20th to 26th September 1979. Telecommunication Journal, Oct. '76. It will be remembered that WARC 79 begins in Geneva on 24th September 1979. The editorial in the Telecommunication Journal advises that the central theme of Telecom 79 will be "Governments. Industry, Research: Partners in Progress". The last exhibition, Telecom 75, embraced 360 exhibitors from 37 countries in a 37 000 m² area and attracted over 100 000 visitors.

SOME FIELD STATION!

Max Dawkins VK3TR
74 Springvale Road, Nunawading, 3131

On December 29th, 1976, 15,000 people converged on a point 20 km south-east of Melbourne to attend the 11th Australian Scout Jamboree. This day and the following ones were to be classified by many people as "never to be forgotten". Amongst those were a handful of amateur radio operators who had volunteered to organise an amateur radio facility at the Scout Camp.

The team of workers led by Max VK3TR and Mike VK3ZVN commenced work in June 1975 to gather personnel and equipment to set up a field station to introduce Scouts to the art of AR. As time progressed, the magnitude of the task became more and more apparent. As well as those in camp it was expected that as many as 100,000 visitors would pass through the camp and any number of these may stop by for a look at the Amateur Radio station.

While this was being organised, two other radio activities were being planned. The Jamboree Publicity Committee had taken up the idea of a fully fledged Broadcast Station, and it had also been decided to provide an introductory construction project for the Scouts.

All three aims were achieved and perhaps the easiest of the lot was the one which, only a few years ago, would have been completely unacceptable. I refer to the Broadcast Station. Liaison with the Australian Broadcasting Control Board resulted in permission for the project to proceed under the conditions of an Experimental Licence. Co-operation from commercial broadcast stations was sought and received — 3DB's mobile studio and audio equipment arrived on site on the 23rd December. The transmitter was housed in a cupboard in the van and coupled to the audio equipment via an audio compressor and out to the aerial via 50 ohm coaxial cable. The transmitter was christened officially as a type "Fisher Mark 1", originally starting life as Ron VK3OM's 160 metre rig, and now converted to crystal watts was officially logged and fed into control on 1550 kHz. An output of 6.6 watts was officially logged and fed into the aerial. A 50 ft telescopic mast (by courtesy of Hills Antennas) fitted with some top loading in the form of half of Ron's 160 metre helical. Some L and C at the base of the mast provided a feed point for the coax. Jamboree Radio was ready to go on the air at 6.00 a.m. on 29th December. Operation was then from 6.00 a.m. until 8.00 p.m. each day until the official close down on the 6th January. Thanks go to Colin Tyrus of 3AW and Paul Mason (Telecom Australia) for organising the programs and staff.

In the meantime, two tents had been arranged for each of the other activities — a 45 ft x 20 ft marquee for the construction, and an 80 ft x 20 ft marquee for the "shack". The main organisation of the construction project was handed to Bob VK3AIC to get his teeth into. The unit to be built was a discrete component flip-flop capable of operating in several different modes — a morse code oscillator, a flashing lamp or as an amplifier. About 1,000 boys took part in this activity with hundreds of boys having to be turned away, showing a real need for more of this type of introductory project for the 12 to 14 year old boys.

Meanwhile, on the AR front, aerial masts had been erected. Three of these towered to 60 feet above the ground and were arranged in a triangle. Dipoles for 160 metres, 80 metres and 40 metres were hung at 60 feet on the three sides of the triangle. The two prizes of the aerial farm were hauled to the top of two of the poles — a Hygain TH6DXX on one (with a 2 metre Ringo above it) and a TH3MK3 (with a 27 MHz vertical above it) on the other. The fourth aerial pole was quite a small one, being a bare 30 feet high. On the top of this, however, were two beams — a 10 element two metre and a wide spaced 6 element 6 metre beam (boom length 24 feet). A 2 metre quarter wave on the side of one of the 60 ft poles at about 40 feet provided an aerial for 2 FM.

The dipoles were fed with half-wave length open wire lines and then to baluns to provide coaxial inputs. All other aerials were fed with coaxial cable to the mast heads directly using matching as required at that point. Baluns and a HAM 11 rotator for that BIG beam were loaned for the period by Vicom International and the other beams were ably supported by Stolle rotators on loan from Hills Antennas.

Inside the shack, the equipment finally took shape. Two complete HF stations comprising FT101E transceivers, driving in one case an FL2100B linear, and in the other an FL2500 linear (thanks, Jack VK3APU). Auxiliary equipment for the first station was as follows — an external VFO, a monitorscope, a panoramic adaptor and a digital frequency readout (thanks, John VK3JH). On the VHF side of the fence an IC502 plus 10 watt linear and an IC202 plus a 25 watt linear (thanks, John VK3BAF) gave us our SSB facilities. Several FM rigs were on the side for special contacts.

Having put everything together, it was then an easy (?) matter to commence operation at midnight on the 28th December and operate 24 hours a day until 5.00 p.m. on the 6th January. Who said it was easy? Four hours sleep a day, too many cups of coffee and many exciting DX contacts contributed to the reasons that allowed us to survive the ordeal. The best

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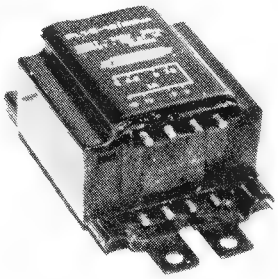
IN THE INTERESTS OF SAFETY

The Ferguson Engineering Staff considered improvements to the terminations were necessary. It was decided to make a transformer which was designed to comply with Australian Standard C126. The result looks like this: —



Advantages:
- 8 Secondary Terminals.
- Quick-connect pinlok type connections.
- 6 x 30 cm leads supplied with shrouded receptacles.
- Low-profile configuration with mounting holes as well as slots.

The range of output voltages is: 1.5V, 3V, 4.5V, 6V, 7.5V, 9V, 10.5V, 12V, 13.5V, 15V and 18V.

Additionally, centre tapped configurations also available, e.g. 9V-0-9V, 7.5V-0-7.5V, 6v-0-6V, 4.5V-0-4.5V, 3V-0-3V and 1.5V-0-1.5V

Two types are available: PL 1.5-18/20VA at 1.11 AMP and PL 1.5-18/40VA at 2.2 AMPS.

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estimate we can make is that between 10,000 and 12,000 visitors passed through the shack, our logs tell us we made 1420 contacts to 72 different countries, including many quite rare ones. Some of the interesting ones included three out of the four A4X stations licensed, 4U1ITU Geneva, HB9S — the Scout World Bureau station in Geneva and many others.

The interest shown in amateur radio generally could not have been any greater. The questions asked by Scouts and Scouters were very intense and *in many cases were obviously based on knowledge gained from the current popularity of 27 MHz.* Most questions were satisfactorily answered and in many cases converts to Amateur Radio were made, again indicating the need for more pro-amateur propaganda throughout the community.

The project was organised overall by the Blackburn District Scout Radio Club, a small but keen club who were ably supported by the Eastern and Mountain District Radio Club. Any enquiries from would-be members or supporters of the Scout Club are welcome to contact me at home, QTHR. The club meets at Blackburn on the second Sunday of each month and we would be glad to see any prospective members.

Thanks to the following ops for their assistance: VK3's, ZZB, YCP, ADD, ZVN, ZND, KX, BEX, YAN, AIC, AIS, AYO, LM, ZDM, NAW, AUM, BII, IO, ZU and NAK, VK2ZUR, JR3THH, JR2KDA and KG6JHQ. ■

TONY VK3IO LOOKS ON AS A SCOUT TESTS HIS HANDIWORK

ABOVE: NICK VK3ZND WAS TAKING NO CHANCES FIXING SIGN TO A MAST — (IT FELL DOWN 3 DAYS LATER)

LEFT — THE SHACK AND ANTENNA FARM AT VK3BSA/P

RAISING THE ANTENNA FOR THE JAMBOREE BROADCAST STATION

BILL VK3ZMI LENDS A HAND IN THE CONSTRUCTION TENT

PHOTOS BY BILL ROSE

AN AR SPECIAL

A REVIEW OF THE KENWOOD TS-700A TWO METRE ALL MODE TRANSCEIVER

The new Kenwood TS-700A is a fully self-contained AM, FM, CW and SSB transceiver. Full coverage of the 144/148 MHz amateur band is provided in four 1 MHz bands. Whilst now on the Australian market, a version with 144/146 coverage has been available on the Japanse and European markets for some time. It would seem that providing a full four megahertz coverage on a transceiver of this type is not without its problems as other companies now producing VHF gear have yet to market a transceiver of this type. With the addition of the TS700A, Kenwood are now well represented on the Australian scene with a complete range of fine equipment.

FEATURES OF THE TS-700A

The TS-700A has a full VFO coverage of the two metre band from 144 to 148 MHz in four bands. The VFO and its associated tuning mechanism is similar to that found on normal HF transceivers except that there is 1 MHz coverage instead of the usual 500 kHz. The only feature not included in the basic package is VOX. This is, however, available as an external plug-in extra.

Enclosed in a steel cabinet measuring 278 mm wide, 124 mm high and 320 mm deep, it has a smaller front panel than its HF relation the TS-520, but is almost the same depth. Appearance bears a strong relationship to other current Kenwood models. The effect of the grey panel and cabinet with a brushed chrome trim around the panel and control knobs contrasts with the vivid green illumination of the "S" meter and main dial calibration scale to produce one of the prettiest rigs available at the moment. Facilities include both normal and reverse repeater off-set for FM operation; selectable upper or lower sideband on SSB; provision of 11 crystal controlled channels for fixed frequency operation (crystals are, of course, optional for this facility).

The front panel meter reads either relative power output, signal strength or as a centre zero discriminator indicator to facilitate netting on FM.

Transmitter power output is rated at more than 10 watts on FM and CW, 3 watts on AM and 20 watts DC input on SSB. The reason for rating SSB on an input basis is not stated. An AC power supply is built in and AC or DC operation is selected simply by plugging in the appropriate power cord, both of which are supplied with the set.

Receiver offset tuning is available on all modes as is a noise blanker for SSB reception and a squelch control for FM. Another optional extra is a tone generator for tone access repeaters. This would not be needed for Australian repeaters.

The main tuning dial has two speeds, one giving a 25 kHz per turn rate and the other 100 kHz per turn rate. The dial plate at the back of the tuning knob assembly is calibrated in 1 kHz segments.

Accessories supplied with the TS-700A include a push to talk dynamic microphone, an assortment of plugs and spare fuses, AC and DC power cords, and a pair of extension feet to enable the front of the transceiver to be tilted up slightly.

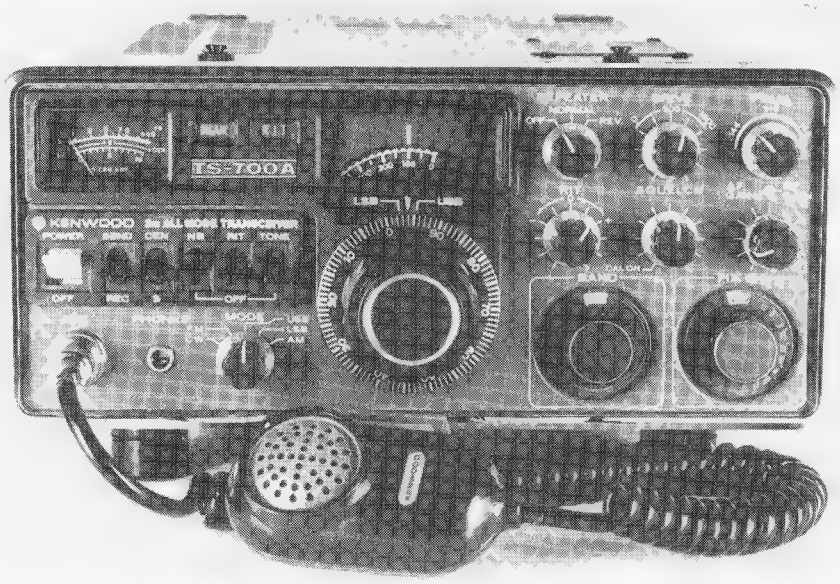
The circuit is fully solid state and uses a total of 63 transistors, 17 FET's, 3 IC's and 100 diodes. Construction is on nine main printed circuit boards which are connected together by a comprehensive wiring harness. Accessibility for service would not seem to be one of the TS-700A's good points. However, the front panel can be easily removed and the final amplifier can be detached by removing several bolts securing it to the rear panel of the rig.

THE TS-700A CIRCUIT

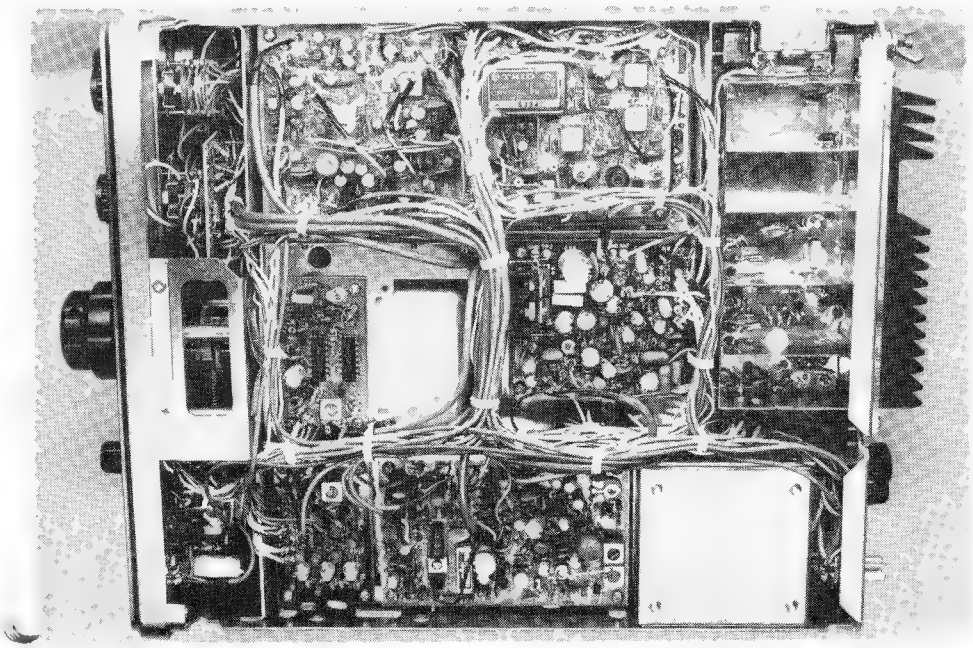
Although the TS-700A is naturally a complex piece of equipment, the circuit is easily sorted out. Firstly it should be noted that no phase locked loops are incorporated and that the signal paths are straight forward, more or less on the lines of the more familiar HF transceivers. On SSB, AM and CW the transceiver operates in a single conversion set-up with a 10.7 MHz IF and a filter that provides 2.4 kHz selectivity on all these modes. For FM, the 10.7 MHz IF is followed up with a 455 kHz section to provide the correct selectivity and required limiting for this. Naturally the 10.7 MHz take off point for this section is before the high selectivity filter used for SSB.

The VFO used in the TS-700A is of the same design as the one employed in the TS-520 but modified to provide a full 1 MHz coverage. The actual tuning range of the VFO is from 8.2 to 9.2 MHz. The output of the VFO is mixed with the heterodyne oscillator to give the actual output frequency. The heterodyne oscillator employs six crystals, four of which mix with the VFO to give the four bands of normal operation. The other two are selected with the repeater offset selector and operate on the 146 and 147 MHz segments only. These two crystals are switched in and out automatically for either transmit or receive depending on whether normal or reverse repeater operation is selected. The heterodyne oscillator frequencies are 125.1, 126.1, 127.1 and 128.1 MHz for simplex working with the two repeater off set crystals on 126.5 and 128.7 MHz. Extensive use is made of balanced mixers throughout the transceiver which is perhaps one of the factors why spurious responses are practically non-existent.

Transmitter output and receiver input are both fed through a band pass filter network which is tunable via the front panel 'FINAL' control. This serves two purposes. It gives the receive section



KENWOOD TS-700A — PHOTOS BY KEN REYNOLDS VK3YCY



INSIDE THE TOP COVER OF THE TS-70OA

excellent front end characteristics with a total absence of cross modulation. It also assures a transmit output free from spurious signals. A calibrator provides 100 kHz marker points. These are derived from a basic 10 MHz crystal followed by a buffer stage and two divide by ten stages.

Three different modes are produced in the transmitter generator unit. The SSB carrier generator which also acts as the receive BFO, feeds a four diode balanced modulator for SSB generation. On CW the balanced modulator is unbalanced to produce the carrier required. A separate low level AM modulator delivers normal double sideband signal, however, the carrier output from the transmitter has to be kept to about a quarter of the normal CW output to make allowance for the peak output of the AM signal. All modes are produced at 10.7 MHz plus or minus a small amount for USB, LSB or the AM/CW frequencies.

THE TS-700A ON THE AIR

Firstly the transceiver was put through a series of tests to determine its actual capabilities. Just how these findings translate into actual operation in the shack will be discussed later.

Receiver sensitivity was checked first. 20 dB of quieting was achieved at an input of .25 uV on 148 MHz and .18 uV at 144 MHz. This of course was on FM, and with the squelch control set just on the mute opened with .14 uV input at 146 MHz.

Sensitivity for SSB was measured at 144 MHz and the following results were obtained: .1 uV produced a 4 dB signal to noise ratio, .5 uV gave 22 dB, and 1 uV gave 26 dB. The calibration of the 'S' meter was next tabulated.

For FM		For SSB	
S1	2.0 uV	S1	.8 uV
S3	2.4 uV	S3	.9 uV
S5	2.9 uV	S5	1.9 uV
S7	5.6 uV	S7	2.6 uV
S9	25.0 uV	S9	9.0 uV
S9 + 20	2.0 mV	S9 = 20	100 uV

As received the 'S' meter would not read above S9 + 20 dB and all readings were taken with the meter set as received. However, it is possible to readjust this with an internal preset control.

The maximum deviation accepted by the receiver was ± 7.0 kHz. Above this figure the distortion on the received audio increased rapidly.

Transmitter power output was next on the list. CW and FM output at 146 MHz was 14.0 watts and SSB peak output at 144 MHz was 10 watts. Somewhat higher output on SSB could be obtained higher in the band.

Transmitted FM deviation was set at 6 kHz as received from the agents, but the FM microphone gain control was set far too high. When this was reset the transmitted audio quality on FM was judged to be fairly good, although somewhat lacking in high frequency response. Transmitted audio on SSB was judged excellent with a very acceptable degree of balance between highs and lows. Received audio quality on FM was slightly lacking in high frequency response, but on SSB it was excellent and quite comparable with any good HF transceiver.

VFO stability was checked and found to be very good. From a cold start the total shift did not exceed 500 Hz but the linearity of the dial calibration was only fair. Setting against the calibrator at the low end of the band, the calibration error increased up to a maximum of four kHz at the centre of the band and then gradually returned to reference at the high end of the range. So long as the calibrator is used frequently when moving up and down the dial no real problems should exist.

The FM discriminator was out of balance on our review transceiver. With the meter switched to the centre zero position, the zero point was accurate and stable but on tuning through a signal, the needle swung much further one way than the other. We did not check this further but it could have been the reason why the receiver was very critical to deviation over 7 kHz. At 144 MHz the calibrator was 700 Hz off frequency.

Next we transferred to the shack to actually try the TS-700A on the air. The tuning control had a rather odd feel about it. On rotating the knob every tooth in the gear drive could be felt and when using the fast speed tuning to traverse the band a noise like filing metal was produced. Several visitors were invited to try the tuning and opinion was divided, some liked it, others did not.

Tuning up was easy. The FINAL control could be set for the desired portion of the band, the actual peak being very broad. The DRIVE control was peaked on transmit in either the FM or CW mode and again it proved to be very broad. In fact it had only minimal effect on output. Indicator lights signalled the 'ON AIR' condition and also the selection of receiver offset operation.

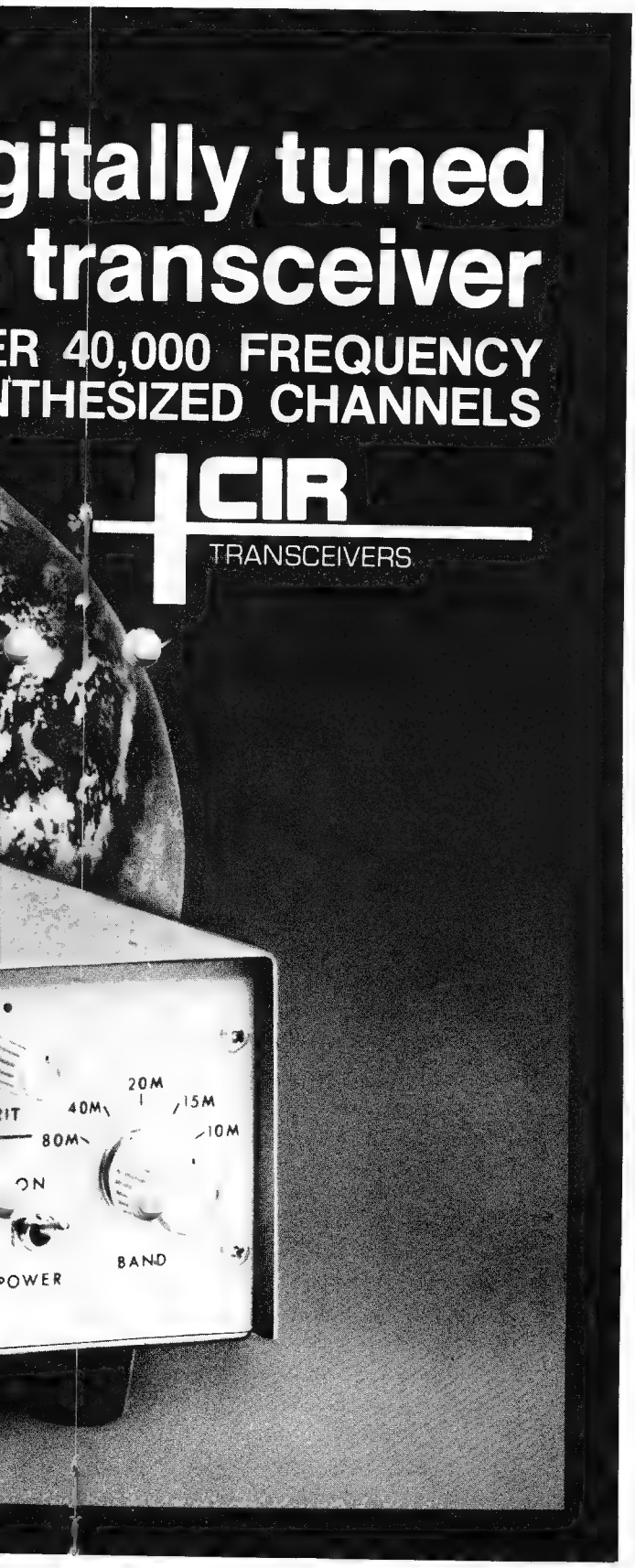
Reception of SSB signals was excellent with good quality and very low audible distortion, due no doubt to the excellent AGC action and the balanced diode product detector. The AGC release time was slow, taking about three seconds to decay from the 'S' 9 point. Fast acting AGC is automatically provided for CW and AM operation. The noise blanker action was fairly good. It was effective on car ignition noise but, perhaps in common with most blankers, its effect was variable on power line and domestic appliance type noise. Using the blanker did not seem to produce any cross modulation.

INSTRUCTION BOOK

The TS-700A instruction book is well written and gives clear information on all aspects of operation. Most of the internal adjustments are covered but, as is usual these days, no actual service information is included. At this point in most reviews we make some criticism of this fact but not in the case of the Kenwood. Available from the distributors at nominal cost is a complete service manual that would delight the heart of any enthusiast. If you are the "fix it yourself" type then all the information you will need is included — circuit board layouts, full parts list, and complete alignment procedure. If you are just the type who likes to see how things work, again this is for you.

In any case, full service facilities are available from the Melbourne agents for Kenwood, Vicom International, 139 Auburn Road, Auburn from whom our review TS-700A was obtained. ■

Sideband Electronics Sales



SPECIFICATIONS

GENERAL

Frequency Coverage

3.5000 MHz - 3.9999 MHz	21.0000 MHZ - 21.4999 MHz	Built-in Digital Synthesizer
7.0000 MHz - 7.4999 MHz	27 0000 MHz - 27.9999 MHz*	in 100 Hz increments
14.0000 MHz - 14.4999 MHz	28.0000 MHz - 29.9999 MHz	
	*receive only	

Frequency Control: Ultra stable digital frequency synthesizer with crystal reference oscillator, 100 Hz digital readout resolution. <20 Hz per hour drift. Frequency accuracy equal to WWV calibration. Additional fine adjust control allows >± 50 Hz for continuous band coverage

External Frequency Control: Rear socket for external VFO or synthesizer input for crossband operation. Frequency input coverage same as that with built-in synthesizer

Modes of Operation: SSB with selectable sideband. CW with automatic 1 KHz offset on transmit Semi break-in with adjustable delay and sidetone comes standard. **Internal features include:** WWV receiver, squelch, noise blanker, VOX, speech processor

Power Input Required: 12-14 VDC, negative ground only (No damage 10V 15V DC)

Dimensions: 2.8" H x 12.1" D x 9.5" W (Depth includes heat sink)
7.2 CM x 30.8 CM x 24.13 CM (Depth includes heat sink)

Weight: 8 pounds, (3 6 kg)

Rear Panel Connectors:

Auxiliary Functions: External L.O. in,
V_{cc} output;
Ground;
V_R control for optional external synthesizer;
EXT L O gate for optional external synthesizer;
EXT MOD in,
Current sink for driving external circuits;
ALC in;
Audio out, 8 ohms

Power. 12-14V DC input
RF. UHF type
Phone Jack Earphones, RCA type (8 ohms)

RECEIVER

Circuit Design: Direct conversion to 5.6 MHz IF using balanced mixer. Exceptional immunity to overload and cross-modulation

Sensitivity: ≤0.3μV for 10 dB $\frac{S+N}{N}$

Selectivity: Crystal ladder 8 pole filter. Bandwidth 2700 Hz @ 6 dB down. 4900 Hz @ 60 dB down. 1 8 shape factor

Image Rejection: >50 dB 80M - 15M
>40 dB 10M

Internally Generated Spurious Response: <1μV equivalent input signal

AGC: 6 dB change in audio level over input range of 0 5μV - >0.1V. (108 dB)

Audio Output: 1 watt available @ <10% distortion, 300-3000Hz

Meter: S units from 1 9, 20, 40, and 60 dB over S-9

Frequency Control: By digital synthesizer with 6 digit readout to 100 Hz. RIT (receiver incremental tuning) allows receiver tuning >± 50 Hz from indicated frequency without moving transmitter frequency

TRANSMITTER

Circuit Design: Broadband design to eliminate the need for tuning. Excellent harmonic and TVI suppression. ALC. Infinite VSWR protection Provision for external ALC input, positive going

Frequency Control: By synthesizer with 6 digit readout to 100 Hz. Fine tuning adjustment allows >± 50 Hz from indicated frequency

Power Rating: 200 watts PEP input and CW input at 13.6 VDC input 50 Ohm non-reactive

Power Output: 100 watt PEP and CW @ 13 6 VDC input An ideal power output level for driving most grounded grid linears

Unwanted Sideband Rejection: >60 dB down @ 1000 Hz audio

Carrier Suppression: >50 dB down

Two Tone Modulation: >30 dB below peak power level

Harmonic Output: >45 dB below peak power level

CW Transmit: Semi break-in with sidetone standard. Automatic 1 KHz offset on transmit frequency

Spurious Output: >50 dB below peak power level

Transmit Control for SSB: PTT standard. VOX with option

Microphone Input: Dynamic or crystal, high impedance

Audio Response: 300 to 3000 Hz ± 6 dB

Meter: Reads ALC on transmit or forward and reflected power

Linear Amplifier Control: Auxiliary socket on rear provides for keying of linear

Cooling: Large capacity heat sink fins supplied. For SSTV, RTTY, and semi-continuous transmit, forced air cooling on heat sink fins recommended

INTEGRAL OPTION

400 Hz CW Filter: Narrowband 8 pole crystal filter and associated components for ASTRO 200. Order Model NBF-200

Sideband Electronics Sales

For personal attention: **24 KURRI STREET, LOFTUS**
P.O. BOX 184, SUTHERLAND, 2232

OPEN ON SATURDAYS TILL 12 NOON
TELEPHONE: 521 7573

PETER SCHULZ, VK2ZXL.

VK-ZL OCEANIA Dx CONTEST RESULTS FOR 1976

Some observations . . .

1. For various reasons, VK and ZL results with relevant certificates are being posted out earlier than usual. Overseas results will not be available for at least six weeks or more.

2. Participation Cards — as part of NZART Jubilee — have been sent to all who submitted logs. Unless SASE or IRC was sent, these went via QSL Bureau.

3. Increased ZL support was to be expected but there is also a considerable increase in VK logs compared with 1975. Continuing lack of activity from ZL4 is unfortunate. Tremendous support is already in evidence from Japan — as well as from Czechoslovakia.

4. Publicity in some areas around the world left much to be desired — regrettable.

5. As well as being sent to overseas certificate winners (and major Societies) overseas results will be publicised in "Break-In" and in "Amateur Radio".

6. The manner of scoring for VK and ZL entrants has been raised. The "BERU" system was introduced to provide the most equitable system for VK's and ZL's and from personal experience it has not been too difficult to manage — even when present logs have to be re-scored! Admittedly it does take longer — but it also helps in checking contacts made. Because of the great increase in the number of prefixes available, it is suggested that these could be used as a new basis for scoring . . .

FOR VK/ZL STATIONS: 1 point for each contact on a particular band with the score for that band being the total of contact points multiplied by the total of different prefixes worked on that band. (NOTE: This means that W1, K1, WA1, WB1, etc., would all be different — as would JA1, JJ1, JG1, JR1, etc., etc.) Total "all bands" score would be the sum of the totals for individual bands.

7. Jubilee Plaques will be posted to top VK's on CW and on phone and to ZL's on a district and band basis.

8. A few logs were re-scored while others were so set out that this — while desirable — presented too formidable a task! Such logs have the total score indicated with no component band scores.

9. One log at least was unreadable to the extent that re-scoring was impossible. There should be no need to re-write or type logs — a carbon copy of the operating log is sufficient. For the "speedy" operator this means some preparatory work — and the omission of some mundane details.

10. Whether because of the proliferation of contests — or because of an "apparent" lack of interest, the continuation of VK/ZL/O has been investigated on several occasions and comments by WIA in "Amateur Radio" are noted. Here is one fact which is often overlooked — the number of logs received (on a smoothed average) has steadily increased during the period NZART records have been kept — from a total of 192 in 1954 to the high of 791 in 1969 which was NZ Bi-Centennial (696 in 1970 for Australia Bi-Centennial) to 519 in 1972; 465 in 1973; 511 in 1974; 436 in 1975 and an estimated 500 plus in 1976 (SWL logs not included). A major problem would be lack of consistent interest and activity by VK's and ZL's. From comments received and from observations, overseas interest in "VK/ZL" is high. Another major problem is organisation and costs. Organisation calls for the availability of personnel with time to attend to the very great administrative load expeditiously and with honorary appointments this is asking a great deal — and costs! — these are escalating — each certificate sent out this year would cost NZART at least 50 cents but some values cannot be measured by cost alone. Nevertheless, this is food for thought.

11. My appreciation is extended to all who submitted logs — many of which were obviously not trophy winners. Without the interest and co-operation of such people this contest activity would collapse.

12. NZART sponsors numerous operating awards which might provide some stimulus to your enjoyment of amateur radio. There are grades of difficulty to suit all — from the prestigious "5 x 5" requiring "know-how" on "all bands" to others which require a reasonable degree of activity.

13. Your comments on the organisation of this contest would be appreciated.

73

Jock White ZL2GX, NZART Contest and Awards Manager.

RESULTS

VK — CW

Call	80	40	20	15	10	Total
2APK	450	4210	7565	3465	265	15995
2GW	545	1885	6790	2580	—	11800
2AFG	225	2795	6085	1745	55	10935
2BJL	480	1575	6055	2275	210	10595
2CAX	620	2325	5435	1900	—	10280
2QL	135	55	365	920	710	2185
3MJ	385	1970	5320	2345	—	10020
3QI	—	7265	—	—	—	7265
3VF	410	—	4770	1740	—	6920
3CM*	540	540	3080	1435	—	6325
* plus 730 on 160 m						
RRJ	—	—	—	2470	—	2470
3XB*	2015	55	—	—	—	2125
* plus 55 on 160 m						
3VQ	—	—	—	—	—	1680
3MR	915 on 160 m					915
3AT	—	—	680	220	—	900
3KS	—	110	—	—	—	110
4XA	365	3530	6900	4225	1670	16690
4HE	—	3840	5020	—	—	8860
4DO	—	—	—	5485	—	5485
4LV	—	—	2500	360	—	2860
4XY	—	—	1820	—	—	1820
4KX	—	975	385	—	—	1360
5NO	—	665	6480	2770	705	10615
5QQ	—	—	7135	1580	—	8715
5RX	—	840	3895	910	—	5645
5FM	—	—	3120	1645	—	4765
6DS	—	535	4285	4575	—	9395
7BC	380	950	5740	410	—	7480
7HE	—	—	—	—	—	2625
7RY*	455	535	605	—	—	1705
* plus 110 on 160 m						
7JB	—	—	1110	—	—	1110

VK — SWL

Call	80	40	20	15	10	Total
L3042	—	—	—	—	—	4300

VK — PHONE

Call	80	40	20	15	10	Total
1RM	—	—	7640	—	—	7640
1FT	—	530	4180	850	660	7160
1GB	—	265	3905	—	—	4170
1LF	—	—	1650	420	—	2070
2XT	590	1080	9400	6205	1940	19215
2APK	425	2420	8225	2530	1485	15085
2BJL	165	420	6615	1975	—	9175
2ABC	—	—	4475	—	—	4475
2PT	—	—	785	2065	—	2850
2BEL*	135	55	675	645	165	1730
* plus 55 on 160 m						
2AKV	—	—	970	165	—	1135
2OW	—	—	270	215	—	485
3AMK	—	—	6610	3200	—	9810
3AKK	—	1155	4620	3670	—	9445
3BHN	—	—	7180	1615	—	8795
3SM	255	265	3625	2090	430	6665
3AIE	—	—	3990	1900	—	5890
3HE	100	—	2825	1490	—	4415
3WT	—	—	1700	1675	485	3860
3XB	—	670	2210	910	—	3790
3CM*	100	410	2815	—	—	3500
* plus 175 on 160 m						
3BBF	55	55	1025	635	—	1770
3ZD	—	—	1310	—	—	1310
3WW	—	—	1190	—	—	1190
3AT	—	—	375	720	—	1095
4AAU	—	—	6685	2725	1000	10410
4TE	675	—	4640	2175	—	7490
4EZ	—	—	5655	1825	—	7480
4PJ*	110	—	1525	2880	—	4570
* plus 55 on 160 m						
4UG	360	—	1815	—	—	2135
4AM	—	—	—	—	—	check
5NO	—	1300	7675	2600	—	11575
5ZZ*	—	1405	3435	1860	—	6960
* plus 160 on 160 m						
5RX	—	345	2350	1920	—	4615
5ZX	—	—	1215	200	—	1415
5ND	—	400	325	—	—	725
6II	—	110	7460	2235	—	9985
6BV	—	—	3225	3500	—	672[illegible]
6PD	—	—	2435	1315	—	375[illegible]
6RU	—	—	1040	—	—	1040
6TU	—	—	110	—	—	110
7BC	210	490	4860	1190	—	6750
7HE	—	—	—	—	—	1940
7MC	750	—	—	—	—	750

ZL — CW

Call	80	40	20	15	10	Total
1BOK	1035	3335	6515	3600	840	15325
1AIZ	1205	4550	3310	2910	1090	13065
1NG	—	855	4190	3450	790	9285
1BJH	255	1450	2965	3665	—	8335
1AMO	—	7620	—	—	—	7620
1AFW	320	1160	2860	1470	870	6680
1AIH	—	6640	—	—	—	6640
1HV*	520	1545	1705	765	—	4725
* plus 190 on 160 m						
1AMM	55	900	335	—	—	4310
1MT*	420	55	975	600	—	2315
* plus 265 on 160 m						
1AXX	1590	—	—	—	—	1590
1MT	420	55	975	600	—	2315
1MQ	510 on 160 m					510
1BII	—	—	—	—	—	check
2UW	400	8335	4570	2160	—	15465
2BR	460	4635	5735	3135	55	14020
2AGY	—	5355	4575	2235	210	12375
2GW	365	1005	2790	1430	—	6255
2ACP	—	5300	—	—	—	53[illegible]
2KX	—	3365	—	935	—	43[illegible]
2AUP	165	815	2230	—	—	3210
2MM	—	—	2305	—	—	2305
2AHD	—	—	—	155	—	155
2GX	—	—	—	—	—	check
2AHC	—	—	—	—	—	check
2AWH	—	—	—	—	—	check
2BGE	—	—	—	—	—	check
3GQ	—	11840	1805	2125	—	15770
3GG	1120	5815	5920	1410	—	14365
3BK	420	3635	5710	3290	—	12055
3PJ	1410	—	—	—	—	1410
3ABC	—	—	600	—	—	600

ZL — SWL

Call	80	40	20	15	10	Total
ZL1-49	—	—	—	—	—	8090
ZL2-129	—	—	—	—	—	2290

ZL — PHONE

Call	80	40	20	15	10	Total
1BKX*	320	4480	9995	4605	—	19580
* plus 180 on 160 m						
1AXB	—	—	12795	—	—	12795
1AIZ	780	3260	4285	2915	110	11350
1AGO	—	—	8755	—	—	8755
1AKY	110	920	2120	4365	110	7625
1BOQ	—	6560	—	—	—	6560
1BOK	—	—	—	6400	—	6400

ZL — PHONE (continued)

1IB	310	—	5115	890	—	6315
1AMM	55	165	3670	1400	—	5290
1HE	320	—	2575	—	—	2875
1TB	—	—	1710	480	—	2435
1BJH	—	—	1230	990	—	2220
1PN	750	—	—	—	—	750
1AQO*	453	—	—	—	—	745
* plus 290 on 160 m						
1AXX	—	—	—	—	—	check
1BII	—	—	—	—	—	check
2ACP	55	3410	6880	3505	—	13850
2RP	—	—	6210	1940	—	8150
2AHC	245	1425	2480	2410	—	6560
2AH	—	—	4090	1380	—	5470
2BCX	—	—	5055	—	—	5055
2QY	575	210	1605	1600	—	3990
2AWH	1280	—	—	—	—	1280
2AHD	—	55	1020	190	—	1265
2AJB	—	—	660	—	—	660
2NW	—	—	275	—	—	275
2HE	265 on 160 m					265
2GX	—	—	—	—	—	check
3GG	595	3495	6335	1390	—	11975
3BK	420	805	5610	1570	—	8405
3ACS	265	110	2550	960	—	3885
3ABC	165	—	1875	—	—	2040
3TX*	545	55	—	—	—	820
* plus 220 on 160 m						
3ACC	525	—	—	—	—	525
'J	320	780	1130	55	—	2285

VK AND ZL INDIVIDUAL BAND SCORES

All Band —

CW		PHONE	
VK4XA	16690	VK2XT	19215
VK2APK	15995	VK2APK	15085
VK2GW	11800	VK5NO	11575
ZL3GQ	15770	ZL1BKX	19580
ZL2UW	15465	ZL2ACP	13850
ZL1BOK	15325	ZL1AXB	12795

160 m —

VK3MR	915	VK3CM	175
VK3CM	730	VK5ZZ	160
VK7RY	110	VK2BEL, VK4PJ	55
ZL1MQ	510	ZL1AQO	290
ZL1MT	265	ZL2HE	265
ZL1HV	190	ZL3TX	220

80 m —

VK3XB	2015	VK7MC	750
VK2CAX	620	VK4TE	675
VK2GW	545	VK2XT	590
ZL1AXX	1590	ZL2AWH	1280
ZL3PJ	1410	ZL1AIZ	780
ZL1AIZ	1205	ZL3GG	595

m —

VK3QI	7265	VK2APK	2420
VK2APK	4210	VK5ZZ	1405
VK4HE	3840	VK5NO	1300
ZL3GQ	11840	ZL1BOQ	6560
ZL2UW	8335	ZL1BKX	4480
ZL1AIH	6640	ZL3GG	3495

20 m —

VK2APK	7565	VK2XT	9400
VK5QQ	7135	VK2APK	8225
VK4XA	6900	VK5NO	7675
ZL1BOK	6515	ZL1AXB	12795
ZL3GG	5920	ZL1BKX	9995
ZL2BR	5735	ZL1AGO	8755

15 m —

VK4DO	5485	VK2XT	6206
VK6DS	4575	VK3AKK	3670
VK4XA	4225	VK6BV	3500
ZL1BJH	3665	ZL1BOK	6400
ZL1BOK	3600	ZL1BKX	4605
ZL1NG	3450	ZL1AKY	4365

10 m —

VK4XA	1670	VK2XT	1940
VK2QL	710	VK2APK	1485
VK5NO	705	VK4AAU	1000
ZL1AIZ	1090	ZL3GG	160
ZL1AFW	870	ZL1AIZ	110
ZL1BOK	840	ZL1AKY	110

COMMERCIAL KINKS

Ron Fisher, VK3OM
3 Fairview Ave.,
Glen Waverley, 3150

AN SSB FILTER FOR THE YAESU FRG-7 RECEIVER

Since the introduction of the Yaesu FRG-7 receiver only a short time ago, it has established itself as one of the finest low cost communications receivers ever marketed. However, initial low cost must impose restrictions on available facilities and one of these is the lack of a suitable filter for SSB reception. A compromise degree of selectivity has been incorporated in the original receiver for all modes.

Phil Williams VK5NN has come up with the answer and the work involved should not be beyond the scope of the average enthusiast. Over to Phil.

"It is easy to fit a 2.5 kHz filter in the FRG-7 to improve its reception of amateur SSB and CW signals. Suitable Murata filters are listed in the catalogue but are not readily available, so it was decided to use the filter designed by Ian Pogson VK2AZN, employing four of those little red ceramic IF units type SFD 455B, coupled with small 47 pF ceramic capacitors. It is necessary also to adjust the BFO frequencies for this filter and the procedure adopted, requiring no test equipment, is as follows. Fig 1 shows the method of mounting and wiring the filter. There is a spare bank of the mode switch S3, which may be used to switch to the output of the existing kHz filter for AM, or the 2.5 kHz filter for SSB or CW. The total cost of the new filter parts is about 6 or 7 dollars. The attenuation of this filter is a little more than the Murata filter, but the results are not impaired by this and the overall receiver sensitivity is quite adequate.

The filter is so small and light that it will mount on the base of the PCB with the two earth wire tails from the centre terminals of the SFD 455B's. A piece of paper masking tape 6 mm wide around the four units will keep them together. Bell wire was used to connect between the filter outputs, switch and following stage input, keeping the wires well apart to avoid coupling. The copper connection on the PCB was cut with a sharp pocket knife. A strong light behind, that is above the board, will help to locate it.

To retune the BFO it is necessary to first remove the black (earth) and yellow wires from the PCB near TC404, and from the rough loom in the set, and run them around the edge of the PCB via the corner of the chassis. Keep the yellow wire about 3 mm from the chassis — a loop of tape will do this. This avoids coupling from the BFO into the IF strip and ensures that the BFO will not change when you put the set back into its case.

To adjust the BFO, temporarily connect the wide filter in circuit and then tune the set to zero-beat on a carrier such as a broadcast station. Changing sidebands from one to the other should produce a 3 kHz beat which, musically, is near the third octave above middle 'G' on the piano.

Adjust TC404 until this is achieved. Now put the narrow filter into service on S3 and adjust T406 only until changing sidebands on the mode switch, while listening to noise, produces a similar pitch on the noise spectrum. Finally check the receiver for LSB on 7 MHz and below and for USB on 14 MHz and above.

Another method of switching the BFO using a b'ased diode was sent to me by Ron VK5KS. It is shown in Fig 2, which is self explanatory. Ron suggests a small extra capacitor of 6.8 to 10 PE across TC404 may be nedeed. The diode cathode goes to earth and the anode to TC404 and the new 30K resistor.

It is also proposed to explore the addition of a noise blanker for the FRG-7.

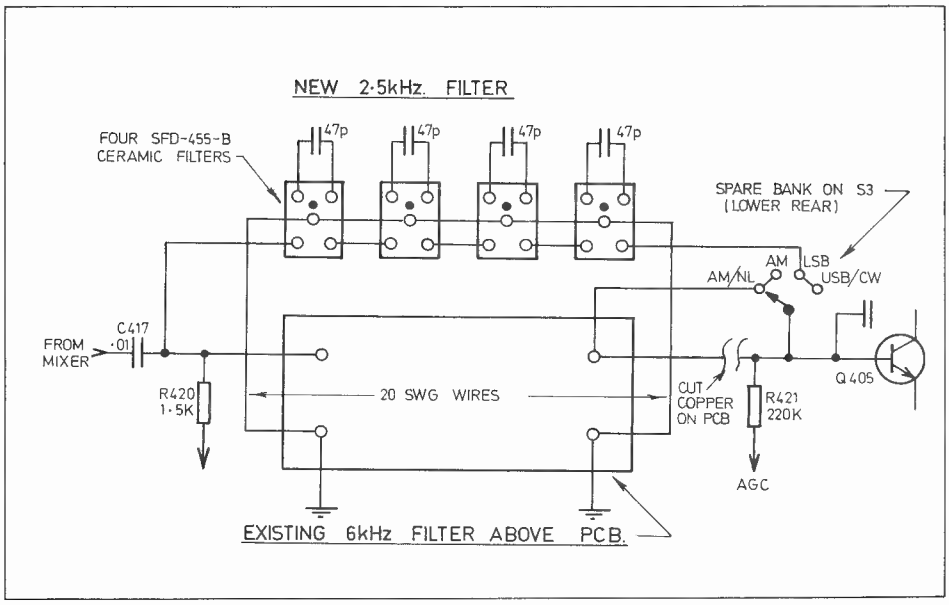


FIGURE 1

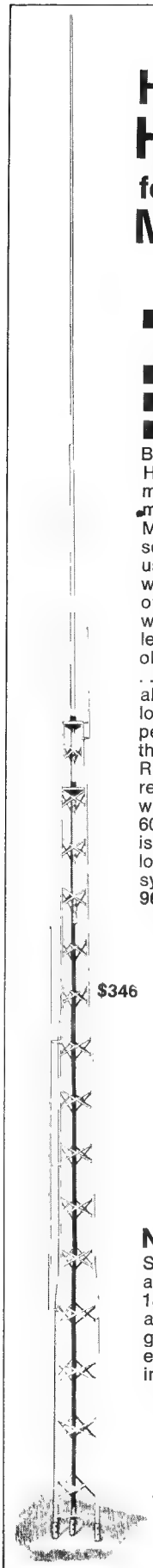
Hy-Gain's Incomparable HY-TOWER

for 80 thru 10 Meters

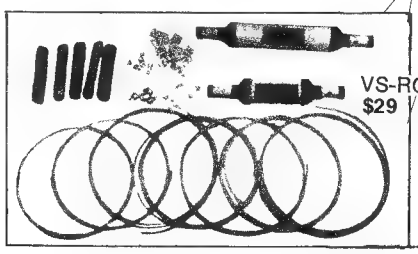
Model 18HT

- **Outstanding Omni-Directional Performance**
- **Automatic Band Switching**
- **Installs on 4 sq. ft. of real estate**
- **Completely Self-Supporting**

By any standard of measurement, the Hy-Tower is unquestionably the finest multi-band vertical antenna system on the market today. Virtually indestructible, the Model 18HT features automatic band selection of 80 thru 10 meters through the use of a unique stub decoupling system which effectively isolates various sections of the antenna so that an electrical ¼ wavelength (or odd multiple of a ¼ wavelength) exists on all bands. Fed with 52 ohm coax, it takes maximum legal power . . . delivers outstanding performance on all bands. With the addition of a base loading coil, it also delivers outstanding performance on 160 meters. Structurally, the Model 18HT is built to last a lifetime. Rugged hot-dipped galvanized 24 ft. tower requires no guyed supports. Top mast, which extends to a height of 50 ft., is 6061ST6 tapered aluminium. All hardware is iridite treated to MIL specs. If you're looking for the epitome in vertical antenna systems, you'll want Hy-Tower. Shpg. Wt., 96.7 lbs.



$346



VS-RG
$29

$102

HIDAKA'S VS-41/80KR

for 10 thru 80 Meters

- **An Individually Tuned High-Q Trap for Each Band**
- **Takes Full Power**
- **Rugged Total Performance Construction**
- **Easily Installed Using Minimum Space**

Now . . . a modestly priced easily errected all-band vertical that delivers outstanding omni-directional performance on each band . . . HIDAKA'S Model VS-41/80KR. It is ruggedly constructed of heavy gauge, taper-swaged aluminium . . . uses four separately tuned High-Q air dielectric traps . . . each trap factory tuned to provide maximum performance 80 through 10 meters. Uncompromised performance for short haul or DX communication is ensured by the low angle radiation pattern developed by the VS-41/80KR. SWR is 2:1 or less on all bands. If mounted in an elevated position a radial wire system should be used. An accessory TRAPPED radial wire kit is available, the Model VS-RG. The VS-41/80KR comes complete with Terelyne guying cord.

TECHNICAL DATA

Power Rating	1 kw AM, 2 kw SSB
Feed Line Required	50-70 ohm coax
Minimum Ground Required	8ft. Ground Rods or VS-RG
Overall Height	28.4 ft.

$49

NEW . . .

Special hinged base assembly on Model 18HT allows complete assembly of antenna at ground level . . . permits easy raising and lowering of the antenna.

The Versatile Model 18V for 80 thru 10 Meters

The Model 18V is a low-cost, highly efficient vertical antenna that can be tuned to any band . . . 80 thru 10 meters . . . by a simple adjustment of the feed point on the matching base inductor. Fed with 52 ohm coax, this 18 ft. radiator is amazingly efficient for DX or local contact. Constructed of heavy gauge aluminium tubing, the Model 18V may be installed on a short 1⅝ inch mast driven into the ground. It is also adaptable to roof or tower mounting. Highly portable, the Model 18V can be quickly knocked down to an overall length of 5 ft. and easily re-assembled for field days and camping trips. Shpg. Wt., 5 lbs.

Above prices include S.T. Freight and Insurance is extra.
90 day warranty. Prices and specifications subject to change.

bail ELECTRONIC SERVICES

60 Shannon St., Box Hill North, Vic., 3129. Phone 89 2213
Distributors in all states and N.T.

FRED BAIL VK3YS
JIM BAIL VK3ABA

JA87677—18

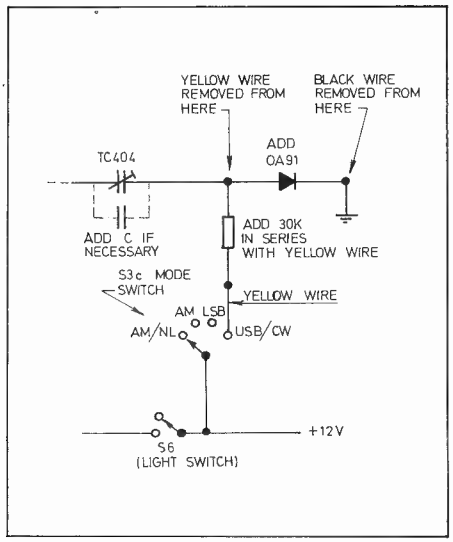


FIGURE 2

We are looking at a version of the one used by VK2AZN in his solid-state Delta-Net Receiver. There is plenty of room in the receiver for six and two metre converters and a separate FM IF strip similar to the VK3ZMU unit from "AR" of June 1970 could be a useful adjunct. The AM/ANL position on the mode switch could be used to switch the latter, as the existing diode noise limiter is not very useful for amateur reception. As a final note of warning to all owners of FRG-7 receivers, I suggest that you see that yours is fitted with a 3-wire power cord. Mine, as delivered, had a 3-pin plug on a 2-wire cord. This is certainly unsafe to you and members of your family. Many amateurs leave the wall switch on at all times and control the gear by front panel switches. A fault could make the case alive.

I had to file out the plastic cord grip to take light duty 3-core flex, and soldered the earth wire to the lug which is pressed into the chassis for this purpose. It is just behind the transformer, easy to find and use."

I am sure all owners of the FRG-7 will be grateful to Phil for his ideas which make a good receiver better. ■

It's warmer up here!

NORTH QUEENSLAND CONVENTION

TECHNICAL SESSIONS & VISIT
PANEL DISCUSSIONS
FOX HUNTS — HOME BREW
FAMILY ENTERTAINMENT

23rd, 24th July

P.O. BOX 964, TOWNSVILLE

RESISTORS	mixed values	$2.00 per	100
¼ W 10 ohm	mixed values	25c per	10
½ W 10 ohm	mixed values	30c per	10
1 W 10 ohm	mixed values	50c per	10
2.7 K 5 W	ceramic 10c each, add 50c P & P. Min. order $3.		

"ACORN" P.O. Box 165, Altona, Vic., 3018

NEWCOMERS NOTEBOOK

Rodney Champness, VK3UG
David Down, VK5HP

AN AMATEUR RADIO TRANMISSION TIMER

Why do you need a device to time your "overs"? You never exceed the 5 minutes allowed between callsigns and you have never been timed out by the local 2 metre repeater — OR HAVE YOU? This device will automatically time your overs from the time you press the button or hit the morse key until such time as there is a break in transmission exceeding 20 seconds. Timing is set to give a 2 second burst of tone just before the expiry of either 2 minutes or 5 minutes total transmission time. The tone burst reminds you to let go the button when you are using the 2 metre repeaters so that you will not be timed out, or to remind you that 5 minutes is up and you should give your callsign.

TECHNICAL DESCRIPTION

The timer consists of three timing circuits interconnected so that the timer will function not only on AM and FM transmissions, but on transmissions where interruptions to the transmitter RF output are normal such as CW or SSB, or where the backwards and forwards operation of the communications does not give a break in transmission longer than 20 seconds. If a gap of greater than 20 seconds occurs the timer will reset.

DC is applied to TR1 via a resistor-capacitor combination, this combination forming a timing circuit with an operate time of between 1 and 2 seconds. TR1 is normally turned off until DC is applied to the input. This input will be about a volt or more but at a very low current. The input can be provided by DC output from a SWR bridge, a crystal set tuned to the transmission frequency, a relay contact within the transmitter switching a small voltage to the input, or from a field strength meter. When TR1 is turned on, TR2 is also turned on and in the short conducting time of TR1 the capacitor in the collector circuit of TR2 is fully charged. The charge on this capacitor gradually discharges through the base-emitter junction of TR3 and this transistor is held on for approximately 20 seconds. TR3 is saturated when it is turned on and its collector is only 0.1 volts positive with respect to earth, which means that TR4 is turned off. TR4 requires about 0.6 volts to turn it on. When the timer is not operating TR4 is normally turned on as TR3 is not conducting and the current through the base of TR4 is enough to saturate it and pull the collector down to 0.1 volts positive with respect to earth. However, when timing, TR4 is non-conducting and pin 4 of IC1 is several volts positive with respect to earth which enables IC1 to commence its timing cycle. At the commencement of the cycle pin 3 goes high in voltage and causes TR6 to conduct heavily pulling its collector down to 0.1 volts which being connected to pin 4 of IC2 inhibits its operation and no tone is heard.

After a period of time the voltage on pins 2 and 6 of IC1 reach two-thirds of the supply voltage causing the discharge circuit via pin 7 to commence operation. Whilst this discharge is taking place pin 3 of IC1 goes low in voltage and TR6 is cut off which means that full supply voltage is applied to pin 4 of IC2 via a 10k ohm resistor. IC2 now starts to oscillate at about 1 kHz and the output is heard in the high impedance miniature loudspeaker. Suitable 2 in. speakers are available from Ham Radio Suppliers or Radio Parts. After a period of 2 seconds IC1 has discharged the capacitor at pins 2 and 6 of IC1 to one-third of supply and at this voltage the discharge cycle concludes and the charge cycle recommences. At this instant pin 3 of IC1 goes high causing TR6 to conduct heavily so that the voltage on pin 4 of IC2 once again goes low cutting of the oscillator. As long as the voltage on pin 4 of IC1 is kept above 1 volt positive IC1 will maintain its timing cycle of either 2 or 5 minutes capacitor charge and 2 seconds discharge. IC2 is keyed *"on"* (oscillates) only during the discharge time of IC1.

The timing plus oscillator operation is not quite as straightforward as the description above would seem to indicate. Problems which are peculiar to the LM555 (NE555, etc.) timing IC had to be overcome before it would time accurately and sound the timing tone only at the end of the timing cycle. If pin 4 of IC1 is earthed as it is in the standby mode, pin 3 is also low which means that TR6 is cut off and pin 4 of IC2 is supplied with full voltage via a 10k ohm resistor, which will turn it on and it will oscillate. This is undesireable as tone would be heard when the timer was not working. D2 was therefore wired in so that pin 4 of IC2 would always be at or near earth whenever pin 4 of IC1 was at or near earth. However, the voltage at pin 4 of IC2 has no control over the voltage at pin 4 of IC1. So when the timer is not operating both pin 4s are to earth or nearly so and neither of the ICs is working. At the instant that the control line to pin 4s goes positive pin 3 of IC1 goes positive saturating TR6 which takes pin 4 of IC2 immediately to earth and no tone is generated.

Another problem with the circuits used with the 555 timer is that the first timing cycle is always longer than subsequent periods. This is due to the fact that the capacitor from pins 2 and 6 of IC1 to earth must be charged from zero volts to two-thirds of supply before the discharge cycle commences. The discharge cycle drops the voltage across this capacitor to one-third of the supply, and it then commences to charge from the one-third supply level instead of the initial zero supply condition. To overcome this prob-

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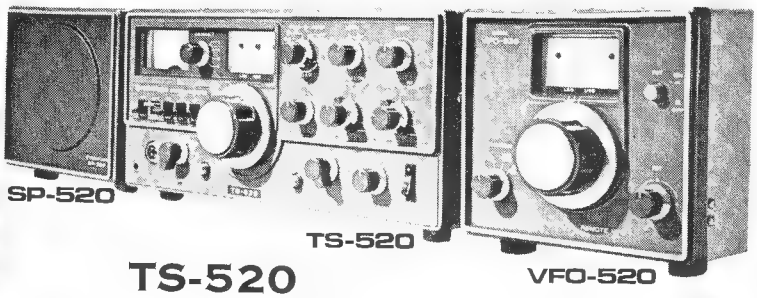
TS-820*



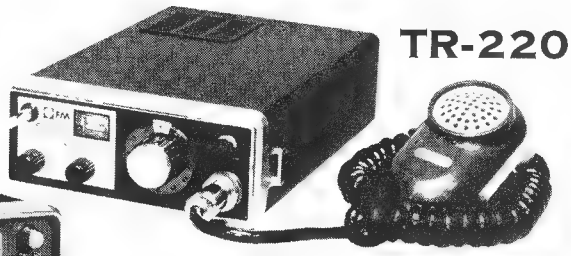
SP-520

TS-520

TS-520

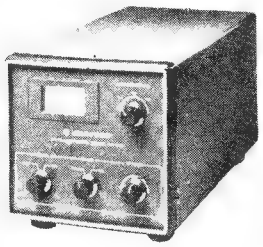
VFO-520

VFO-820

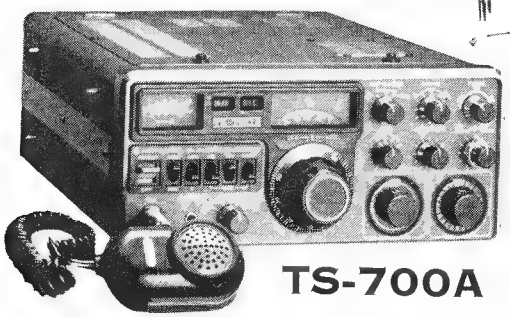


TR-2200

TR-7200



TV-502
TRANSVERTOR



TS-700A

* DUE TO UNPRECEDENTED DEMAND SOME DELAYS HAVE BEEN EXPERIENCED IN THE SUPPLY OF TS820 HF TRANSCEIVERS

lem a separate charging circuit consisting of D1, a 5k ohm trim pot and a 5.6k ohm resistor places pins 2 and 6 at nearly one-third of supply immediately the timing commences. This is a fairly touchy adjustment, but can be set so that the timing of initial and subsequent cycles is accurate to within a few seconds. If the pot is advanced too far the audio oscillator will be keyed on continuously whenever the pin 4s line is positive with respect to earth.

TR7 and the circuitry around it form a simple regulated power supply. The supply is regulated to ensure that no variation in timing cycles occurs due to variations in the supply voltage. This regulator is capable of handling up to 100 mA with a total regulator dissipation of 300mw. The transistor should be fitted with a small clip-on heat sink to dissipate heat. In this particular unit the regulator has only to supply about 30 mA average. The supply voltage can vary from 10 to 15 volts quite safely.

TR5 and the circuitry around it, including the light emitting diode, form an indicating circuit to show when the circuit is actually timing a transmission. The LED is on whenever the line to pin 4 of IC1 is above earth. The LED is wired into the emitter lead so that the voltage on IC1 pin 4 line is not heavily loaded by TR5's base current. The maximum voltage on the pin 4 line will be about 5.5 volts.

The time constants for the timer are selected by switch S1a and select 2 minute time, 5 minute time, or for test purposes a 2 second on 2 second off timing mode. Switch S1b switches in a capacitor which due to the voltage drop when this capacitor is charging through resistors in the 8.5 volt line causes TR2 to conduct and set up a 20 second testing routine. In the test position the timer gives 2 second duration bursts of tone every 4 seconds for about 20 seconds until the capacitor in the collector circuit of TR2 is discharged. This test circuit tests all sections of the timer with the exception of the input circuit. Switch S2 is designed to switch the timer from automatic to manual operation. In the manual mode the unit times every 2 or 5 minutes whether there is a transmission or not. Switch S3 is used to reset the timer back to the start position and would probably be used only in the manual mode. It must be pressed for about 2 seconds if the timer is to reset completely. The manual timing feature would be useful for timing old windbag on channel 50 — use it to wake yourself every 5 minutes of his over.

The ability to continue timing for 20 seconds in the absence of an input in the automatic mode is not used when the manual mode is selected. If manual operation only is required the first 5 transistors can be deleted and S2 wired between pin 4 of IC1 and earth. Position 1 of the switch would be timer off and position 2 would be timer on. The LED indicator could also be deleted.

COMPONENT VALUES

Electrolytic capacitors have a rather wide tolerance of something like +100 per cent of nominal value to —50 per cent of nominal value. For this reason it is suggested that the timing capacitor from pins 2 and 6 of IC1 should be the Tantalum type. Use a 22 uF and 33 uF tantalum capacitor in parallel, 10VW rating or higher. Other components within the timer are not unduly critical with the exception of the timing resistors in the charge circuit of the tantalum capacitors. The resistors can be ¼ watt, and neither these or the other capacitors are critical, a preferred value up or down should cause no problem.

SETTING THE TIMING PERIODS

Switch the unit to manual so that it commences timing, with S1 set to test. All being well the oscillator will be pulsed on for 2 seconds every 4 seconds. Advance the 5k ohm trim pot until the oscillator runs continuously, and then back it off until the oscillator just stops and then comes on again in 2 seconds. Now set S1 to 2 minutes, press the reset button S3 for a couple of seconds, release and commence timing the unit with your watch. After a period of time the oscillator will be pulsed on for 2 seconds. Let the unit run for a further period and record the times between first and subsequent tone bursts. Now set S1 to 5 minutes and repeat the process. If the variation is within about 6 seconds or 15 seconds for the respective settings of S1, setting of the 5k ohm trim pot is sufficiently accurate.

Reset S1 to 2 minutes and set the 2 minute trim pot at mid travel. Note the elapsed time obtained over a timing cycle, if the time is longer than 2 minutes reduce the value of the appropriate trim pot, and try again. After a few timing cycles and judicious adjustment of the trim pot the timing between tone bursts should be near enough to 2 minutes. The same procedure is used in setting the 5 minute timer. Unless you are most fortunate the adjustment of the two timing cycles will take about an hour to accomplish.

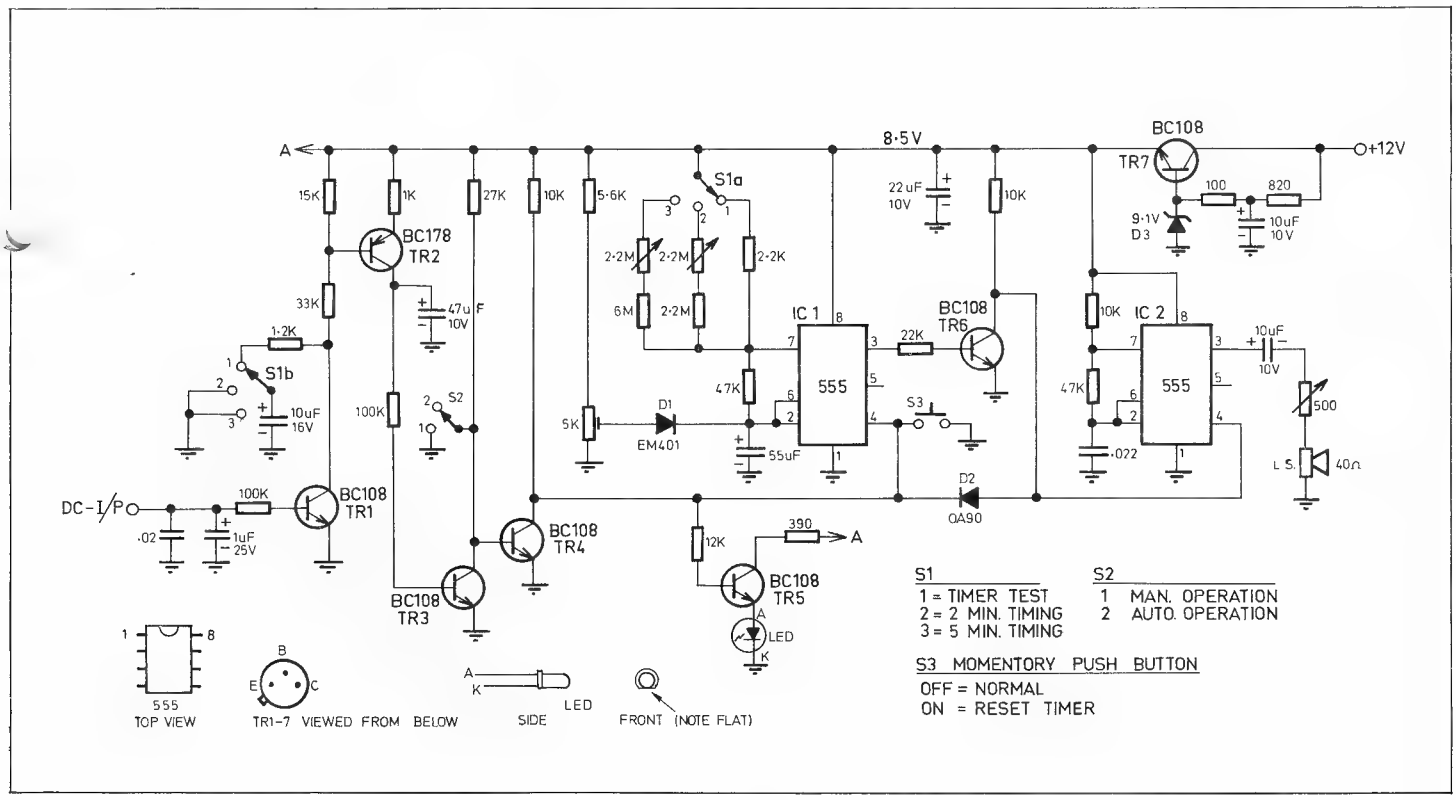


FIGURE 3 — AMATEUR RADIO TRANSMISSION TIMER

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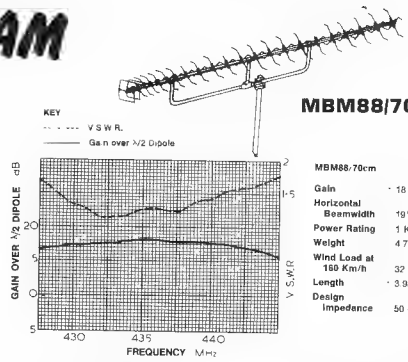

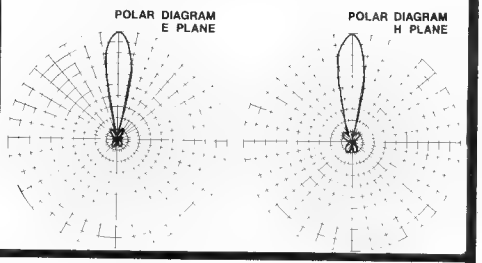

RAK ANTENNA

RAK TRAP DIPOLES

AL48DXN (40/80 metres)	$47
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MIDY IIN (80/40/20m)	$48
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BL50A quality heavy duty dipole (4kW model), 1.8 thru 38MHz, 52 ohms, vswr better than 1.2 at 30MHz. Housed in sealed cycolac which will withstand 250Kg tension. $24
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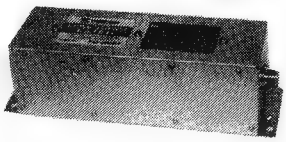

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- Mosfet RF Amplifier Inductively Coupled to Mosfet Mixer
- All Signal Path Inductors utilise Printed Stripline for long term performance stability
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- Noise Figure = 2.5db (typical)
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- I F = 28 30 MHz
- Aerial and I F Sockets both BNC as Standard

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- Power Requirements 12V DC Negative Earth @ 35 mA (typical)
- I F = 28 30 MHz
- Aerial and I F Sockets both BNC as Standard

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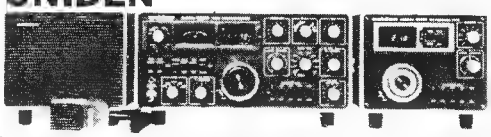

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The loudspeaker used for the oscillator output is a small replacement 40 ohm job selling for under a dollar. The output volume is set by the series 500 ohm pot (another miniature trim pot). 9.1 volt zeners are not always exactly 9.1 volts. The one used in this project zenered at 8.5 volts so a small silicon diode was added in series with the zener in the conducting direction, and this brought the reference voltage back to 9.1 volts.

Having set the timing on manual switch back to automatic, then turn S1 from 5 minutes to test. The unit should now commence the test routine previously described and should cease after about 20 seconds. Place S1 onto 2 minutes timing and touch the active lead of the input pair to the 8.5 volt supply line, the LED should light to indicate that the timer is operating. If the active lead is left connected to the supply line the timer/oscillator will operate after about 2 minutes and will continue to operate for 20 seconds after removing the lead from the supply line.

If the timer is to be operated off a higher voltage than about 9 to 9.5 volts the resistor in series with TR5 should be increased to 470 ohms, so that the LED does not draw above 20 mA.

OPERATING CONDITION TABLE

With TR1 conducting TR2 is also conducting as is TR3, but TR4 is not. TR5 is conducting, IC1 is timing, TR6 is conducting and IC2 is not oscillating. This is the initial start of the timing cycle. When TR1 is off and TR2 is off, TR3 will conduct for 20 seconds after they are switched off. TR4 is off still and the other sections of the timer are as before. When TR3 ceases to conduct due to the discharge of the capacitor in its base circuit, TR4 conducts, TR5 is off, IC1 ceases timing, TR6 is off, and IC2 is not oscillating. Consider now that IC1 has been timing for some time, then the timing period expires. TR6 ceases conduction and voltage is applied to pin 4 of IC2 and it oscillates until IV1 recommences timing after 2 seconds, when TR6 is again conducting with the oscillator control terminal (IC2 pin 4) returned to earth. The timing is done with resistance — capacitance networks and with the exception of TR7, all transistors and integrated circuits are either switched off or switched on hard — this is a digital type of circuit.

SUMMARY

The timer is built on a piece of 0.1 inch pitch veroboard approximately 7 cm square. Some of the features could be omitted if the device were intended to fit inside an FM transceiver — for example. Only one timing cycle would be required and the transceiver speaker could be used for the tone output. The regulated supply for the timer could be taken from a regulated line within the transmitter. The application of voltage from the transmitter itself would initiate the timing so making redundant transistors TR1 to 5 and TR7. Built in a simplified form for some specific purpose it could be made very compact as well as serviceable. The layout of the unit is not critical. Another feature of the timer is that when it automatically resets itself a short burst of tone is sent out. This is caused by TR4 switching slowly from non-conduction to the saturated condition. If as a newcomer you feel that the circuit is too complex for you to attempt, it can be built in 5 sections, the regulated supply centred around TR7, the audio oscillator IC2 with pin 4 strapped to the positive line, the timing circuit IC1 and TR6, the timing indicator TR5, and the automatic timing and 20 second hold circuit TR1 to 4. The break up of these 5 circuit sections is shown by dotted lines in the circuit diagram. Once each section is operating the next section can be built onto it.

If the timer is built "full circuit" as shown in the circuit diagram, it can assist in the following ways — (1) avoid being timed out on the 2FM repeater, (2) ensure that you do not get a note from the P. & T.D. for exceeding 5 minutes between callsigns, (3) ideal as an egg timer when a quick snack is needed during a contest at 4 am, and (4) remind WIA broadcast personnel to give regular callsigns, so setting a good example to other amateur stations. ■

VHF-UHF AN EXPANDING WORLD

Eric Jamieson, VK5LP
Forreston, 5233

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VK4	VK4RTL, Townsville	52.600
	VK4RTT, Mt. Mowbullan	144.400
	VK4RBB, Brisbane	432.400
VK5	VK5VF, Mt. Lofty	53.000
	VK5VF, Mt. Lofty	144.800
VK6	VK6RTV, Perth	52.300
	VK6RTU, Kalgoorlie	52.350
	VK6RTW, Albany	52.950
	VK6RTW, Albany	144.500
	VK6RTV, Perth	145.000
VK7	VK7RNT, Launceston	52.400
	VK7RTX, Devonport	144.900
VK8	VK8VF, Darwin	52.200
3D	3D3AA, Suva, Fiji	52.500
JA	JD1YAA, Japan	50.110
HL	HL9WI, South Korea	50.110
KG6	KG6JDX, Guam	50.110
KH6	KH6EQI, Hawaii	50.104
ZL1	ZL1VHF, Auckland	145.100
ZL2	ZL2MHF, Upper Hutt	28.170
	ZL2VHP, Palmerston North	52.500
	ZL2VHF, Wellington	145.200
	ZL2VHP, Palmerston North	145.250
	ZL2VHP, Palmerston North	431.850
ZL3	ZL3VHF, Christchurch	145.300
ZL4	ZL4VHF, Dunedin	145.400

The Brisbane beacon on the 70 cm band was omitted from the last list so it is now included. Originally set up on 432.000 MHz, by the time you read this it should be operating on its permanent frequency of 432.400.

Aub VK6XY advises all the four beacons in Albany are now located at Mt. Adelaide, about 1 km south of Albany. They are VK6RTW on 52.950 and 144.500, plus the two commercial beacons on 135.5 and 1700 plus MHz. This should prove an interesting exercise for those taking note of propagation characteristics.

SIX METRES

It was not very long into the New Year before six metres ended its run; in fact the DX as noted here seemed to fade out quickly. However, it was a very good season, and most operators should have had enough interesting contacts to have made their time spent on 6 worthwhile . . . 26/12 sent birthday greetings to Rod VK2BQJ (for 25/12, but not heard that day!) Rod reckoned the DX this year provided the best circuit between VK6 and VK2 or vice-versa he could recall in 17 years. Could not wish Wally VK2ZNW at Orange birthday greetings for 1-1-77 as he was not on. In fact, very little was heard of Wally at all this year — perhaps too much Channel O QRM after all! . . . 27/12 Allan VK4ZRF heard the Adelaide FM station on 92.1 MHz at 0200 . . . 3-1-77 Malcolm VK4ZMH who lives 60 miles south of Rockhampton reported hearing a station in Fiji signing 3D2?? calling a P29 at 0830Z with signals S 8/9 for half a minute on 52.049, while Garry P29GR was almost sure he heard JA Language on 52.050 at 1410Z on 1/1. This seems possible as Ross VK4RO reported JA's calling on 52.050 at 0130Z in Darwin, but too weak to work . . . Peter VK5ZPW reported hearing a beacon or similar signal on 30/12 on 50.150 about 0130Z. I have heard this signal myself on Peter's tape and it was signing 1RS5, signals S4/5. At the same time TV sound signals could be heard on 50.680? Anyone any clues to identities?

Mac VK2ZMO writes from Raymond Terrace with some news of 6 metre activity in that northern part of N.S.W., where 6 metres opened for the first time on 12/11 to VK3, after which the band was open nearly every day, with all areas except VK1 being worked. YJ8KM was worked twice by Mac while Bill VK2BMX worked him on 3 watts with an IC502. ZL's were scarce and only worked by Tony VK2ZCT who returned to the band after some years with an FT620B (more news from Mac in 144 MHz segment).

Doug VK4ADC writes advising working between 25/12 and 1/1 the following call areas: VK1, 2, 3, 4, 5, 6, 7, 8, P29, ZL1, 2, 3 and 4 while YJ8KM was worked on 5/12. On 30/12 Doug heard VK7ZAE on SSB at 0200Z at 5/5 on 144 MHz but not having rig tuned up could not work him!

144 MHz SCENE

The 144 MHz band has let its head go to quite a degree during the December/January period and the following is a resume as seen from the VK5 point of view. 23/12 Col VK7LZ worked John VK1ZAR . . . 26/12 Peter VK5ZPS worked Ross VK6ZED in Perth sigs. 5 x 2 . . . 27/12 Jim VK5ZMJ worked Wally VK6WG and Aub VK6XY — not an easy path for Jim. Ray VK3ATN 5 x 5 at VK5LP, while John VK5ZJP worked Aub VK6XY. Barry VK2ZAY worked Mario VK4MS at 0800Z, but signals weak. Mario then worked David VK2ZVW with signals to 5 x 9. Gerry VK5ZZZ worked VK5ZBH at Ceduna 5 x 7. Reg VK1MP now has 300/400 watts on 144 — should help him to be heard! . .. 144 MHz path open between Adelaide and Albany all the time between 24/12 and 27/12 . . . David VK5KK heard by Peter VK7PS on 31/12 but unable to break in . . . 2/1/77 Aub VK6XY copying VK5VF beacon all day . . . 23/1 Col VK5RO worked VK3AFR, VK3ZJP, VK3ZHY, VK3AKC etc. . . . on 10/1 Col VK0RO worked a heap of VK3's, and heard VK7ZAH but not worked . . . Peter VK5ZPW hearing Frank VK2ZI in Broken Hill on Channel 40 on 21/1, 22/1 and 23/1, almost out of the noise . . . Steve VK5ZIM returning from Melbourne advised having 3 pages on contacts on 2 metres while there, reports a lot of activity in VK3, and worked three stations in VK7 while at Wilson's Promontory on SSB . . . 144 open again to Albany on 24/1, 25/1, 29/1 and 30/1 . . . Col VK5RO worked more than 30 stations in VK3 on 29/1 and 30/1 with stations worked east of Melbourne; Roger VK5NY and others in on that opening too, even VK5LP worked 10 stations which is not bad for my location — Les VK3ZBJ was the strongest peaking to S8 for over two hours on 29/1.

Probably pride of place for happenings on 144 MHz SSB would have to go this time for the sporadic E opening at about 0740Z on 31/12 when for a period of about 45 minutes the band opened to VK2 first of all and then to VK1. Signals mainly favoured David VK5KK and myself, VK5LP with an odd contact being available to a few stations

ELECTRONIC ENTHUSIASTS EMPORIUM

POPULAR INTEGRATED CIRCUITS IN STOCK

CA3012	4.60	CD4026	3.30	CD4724	3.85	LM380N	2.75	MC1496K	2.75	UAA180	3.25
CA3013	5.80	CD4027	1.05	CD40097	1.80	LM381N	3.20	MC1590G	6.75	UA723C	LM723
CA3018	3.50	CD4028	1.80	CD40098	1.80	LM382N	2.60	MC14553	12.50	UA757	3.80
CA3023	6.80	CD4029	2.65	CD40174	2.90	LM387N	2.75	MC1648P	4.90	ULN2208	2.45
CA3028A	2.60	CD4030	.95	CD40175	2.90	LM395K	6.90	MC4044P	4.90	ULN2209	2.45
CA3035	5.20	CD4031	4.70	CD40192	2.90	LM555CN	1.20	OM802	3.20	ULN2111	2.10
CA3039	2.10	CD4035	2.35	CD40194	2.90	LM555H	1.95	SAJ110	2.50	74C00	.55
CA3046	LM3046	CD4040	2.50	CD40195	2.90	LM556N	2.95	SAK140	2.50	74C02	.80
CA3053	1.70	CD4041	2.50	DM8097	1.90	LM562B	10.90	SD305DE	1.30	74C04	.55
CA3059	8.40	CD4042	1.95	HEF see	"CD"	LM565N	3.50	SD306DE	1.50	74C10	.65
CA3060	8.40	CD4043	2.25	LH0070	6.20	LM566CN	2.50	SL415A	2.70	74C14	2.80
CA3079	4.40	CD4044	2.25	LM114H	4.90	LM567CN	3.50	SD425A	1.80	74C20	.75
CA3080	2.10	CD4045	3.20	LM301AN	.95	LM709N	.95	SL437D	3.60	74C85	3.90
CA3081	2.70	CD4046	3.20	LM301CN	.95	LM710CN	1.25	SL440	1.90	74C86	2.00
CA3082	2.70	CD4047	1.95	LM304H	3.80	LM710CH		SL442	2.90	74C90	2.50
CA3083	2.90	CD4049	.90	LM305AH	3.80	LM723H	1.70	SL447	4.90	74C154	5.70
CA3086	LM3086	CD4050	.90	LM307N	1.60	LM723N	1.25	SL449	1.60	74C160	3.60
CA3089E	2.90	CD4051	2.25	LM308V	2.20	LM725N	5.90	SL610C	7.25	74C162	4.50
CA30900	6.90	CD4052	2.25	LM309K	2.60	LM733CH	2.70	SL612C	7.25	74C174	2.50
CA3091	18.00	CD4053	2.25	LM310N	3.90	LM733N	2.50	SL613C	12.50	74C192	2.80
CA3120E	4.50	CD4066	1.45	LM311A	3.60	LM741CH	1.20	SL620C	9.50	74C901	1.95
CA3127E	4.50	CD4068	.55	LM311H	3.60	LM741CN	.75	SL621C	9.50	74C925	16.70
CA3128E	9.90	CD4069	.60	LM312H	4.90	LM747CH	2.70	SL623C	17.40	80C95	2.20
CA3130T	2.25	CD4070	.55	LM317K	6.90	LM747CN	2.50	SL622C	26.90	**MISC**	
CA3140T	2.25	CD4071	.55	LM318N	5.90	LM748CN	1.20	SL624C	8.80	AL5352	1.50
CA3600	3.30	CD4072	.55	LM319H	7.25	LM1303N	2.60	SL630C	6.90	GL4484	1.80
CD4000	.55	CD4075	.55	LM319N	5.90	LM1310N	3.50	SL640C	10.60	GL5253	.90
CD4001	.55	CD4076	1.25	LM320K	6.90	LM1458N	2.50	SL641C	10.60	OL31	.90
CD4002	.55	CD4078	.55	LM320T	4.50	LM1488N	6.90	SL645C	12.60	RL4484	.39
CD4006	2.30	CD4081	.55	LM322N	4.50	LM1489N	5.75	SL901B	3.90	RL5023	.35
CD4007	.55	CD4082	.55	LM323K	7.90	LM1496N	1.90	SL917B	6.50	FND357	3.50
CD4008	2.35	CD4085	1.65	LM324N	4.50	LM1808N	3.90	SL1310	1.60	FND500	3.50
CD4009	1.50	CD4086	1.65	LM325N	4.50	LM3028	CA3028	SL3046	1.20	9001	1.80
CD4010	1.50	CD4093	1.80	LM326H	4.50	LM3046	3.60	SP8505	8.60	9368	3.85
CD4011	.55	CD4502	2.70	LM339N	3.70	LM3086	3.75	SP8515	12.90	9601	2.90
CD4012	.55	CD4503	1.40	LM340K	4.95	LM3900	1.75	TAA300	2.90	NSN71	2.90
CD4013	.90	CD4510	3.20	LM340T	2.70	LM3905	3.90	TBA570	2.90	NSN74	2.90
CD4014	2.40	CD4511	3.30	LM349N	4.50	LM3909	1.50	TBA700	4.90	TIL306A	
CD4015	2.40	CD4514	6.50	LM358N	3.20	MC1035P	2.90	TBA810A	4.90	11C90	18.50
CD4016	.90	CD4515	6.50	LM370H	4.95	MC1312P	4.80	TB1750A	3.90	95H90	14.50
CD4017	2.25	CD4516	3.20	LM371N	3.90	MC1314P	6.90	TCA220	2.25	2102-2	3.75
CD4018	2.25	CD4518	2.85	LM372H	7.50	MC1315P	10.75	TCA290A	4.90	2513N	17.50
CD4019	2.25	CD4519	1.35	LM372N	4.50	MC1350P	1.95	TCA420A	4.90	S1883	
CD4020	2.50	CD4520	2.55	LM373N	4.70	MC1351P	3.60	TCA580	6.50	S50242	15.00
CD4021	2.25	CD4528	1.80	LM374N	4.90	MC1454G	5.40	TCA730	6.90	MA1002	13.50
CD4022	2.15	CD4539	1.98	LM375N	4.90	MC1458	LM1458	TCA740	6.80	7805CP	2.90
CD4023	.55	CD4555	1.80	LM377N	3.50	MC1468L	6.50	TDA1005	5.50	7824CP	
CD4024	1.75	CD4556	1.80	LM379	7.50	MC1488	LM1488	UAA170	3.25		
CD4025	.55	CD4720	12.60								

In some cases pin for pin substitutes will be supplied.

POPULAR SEMI-CONDUCTORS STOCKED

7400	.48	7483	2.30	74S258	4.75	74LS174	2.70	BD238	1.80	2N3566	.95
7401	.48	7485	2.95	74S196	7.50	74LS175	2.70	BD437	2.80	2N3568	.95
7402	.48	7486	.85	82S23	6.95	74LS181	6.50	BD438	2.80	2N3569	.50
7403	.48	7489	4.50	8281A	3.90	74LS191	4.50	BF173	1.25	2N3638	.55
7404	.48	7490	.90	82S90	7.50	74LS192	4.50	BF180	1.20	2N3638A	.60
7405	.48	7491	1.90	74LS00	.55	74LS193	4.50	BF194	.85	2N3642	.55
7406	1.09	7492	1.20	74LS01	.55	74LS194	2.60	BF200	1.30	2N3643	.55
7407	1.09	7493	1.20	74LS02	.55	74LS195	2.60	BFY50	1.20	2N3694	.65
7408	1.09	7494	2.20	74LS03	.55	74LS196	2.60	BFY51	1.50	2N3731	5.95
7409	.48	7495	1.65	74LS04	.65	74LS221	2.50	BPX25	4.90	2N3819	1.35
7410	.48	7496	2.15	74LS08	.55	74LS253	2.75	BSX19	.75	2N3866	2.75
7411	.54	74100	3.65	74LS09	.55	**SEMICONDS**		BU126	3.85	2N4037	1.25
7413	1.15	74107	.95	74LS10	.60	AC125	1.80	MFE131	1.95	2N4249	.65
7414	2.70	74121	1.20	74LS11	.55	AC126	1.80	MJ802	8.90	2N4250	.65
7416	1.00	74122	1.20	74LS13	1.20	AC127	1.80	MJ2955	2.60	2N4355	.65
7417	1.15	74123	1.40	74LS14	2.95	AC128	1.80	MJ4502	8.90	2N4356	.65
7420	.48	74132	1.90	74LS20	.55	AC132	1.50	MPF102	.65	2N4360	.95
7422	1.95	74141	2.75	74LS21	.55	AC187	1.50	MPF103	.85	2N5245	.75
7425	.95	74145	2.95	74LS22		AC188	1.50	MPF104	1.10	2N5457	MPF103
7426	.70	74150	3 25	74LS27	.60	AD149	2.60	MPF105	.65	2N5458	MPF104
7427	.66	74151	2.20	74LS28	.60	AD161/62	4.50	MPF106	1.15	2N5459	MPF105
7430	.48	74153	1.95	74LS30	.55	AS322	.18	MPF121	1.60	2N5485	MPF106
7432	.66	74154	3.20	74LS32	.70	AT1138	2N301	MPF603	6.90	2N5590	MPF603
7437	.90	74157	2.20	74LS37	.70	ASY17	2.65	TIP31C	1.20	2N5591	11.30
7438	.90	74160	2.75	74LS38	.70	BC107	.35	TIP32C	1.30	2N6027	1.35
7440	.48	74164	2.90	74LS40	.65	BC108	.35	TIP120	3.20	2N6084	21.00
7441	2.80	74165	2.90	74LS42	2.20	BC109	.35	TIP125	3.30	BA102	.80
7442	2.60	74174	2.90	74LS73	.75	BC177	.40	TIP141	4.70	OA47	.60
7445	2 60	74180	2.90	74LS74	.90	BC178	.40	TIP2955	1.70	OA90	.35
7446	2.60	74181	5.95	74LS75	1.20	BC179	.40	TIP3055	1.70	OA91	.35
7447	2.60	74185	4.90	74LS78	.75	BC182	.40	TT800	2N4037	5082-2800	3.20
7448	2.60	74190	3.20	74LS86	.95	BC212	.50	TT801	1.20	40440	2N3731
7450	.48	74177	2.90	74LS90	1.95	BC327	.55	2N301	2N2869	40637A	2.85
7451	.48	74191	2.90	74LS92	1.95	BC337	.55	2N706A	1.20	40673	1.95
7453	.48	74192	2.75	74LS93	1.95	BC547	.55	2N918	1.60	40822	2.90
7454	.48	74193	2.75	74LS95	2.60	BC548	.55	2N2222A	1.20	40841	1.90
7460	.48	74194	2.50	74LS109	.85	BC549C	.55	2N2646	2.50	BZX61	.75
7470	.85	74195	1.90	74LS113	.85	BC559	.55	2N2869	2.70	BZX79	.42
7472	.75	74196	2.90	74LS114	.85	BC639	1.20	2N2904A	1.50	BZX70	1.50
7473	.80	74S00	1.50	74LS151	2.60	BC640	1.20	2N2905	1.20	BZY93	2.60
7474	.95	74S10	1.75	74LS153		BD131	1.20	2N3053	1.20	BZY91	12.50
7475	1.35	74S20	1.75	74LS157	2.40	BD132	1.60	2N3054	1.70	PA40	5.85
7476	.90	74S74	3.50	74LS163	3.95	BD139	1.20	2N3055	1.35	PB60	6.50
7480	1.60	74S112	3.20	74LS163	3.95	BD140	1.20	2N3564	.65	MEL12	1.40
7482	2.30	74S251	5.30	75LS164	2.90	BD237	1.80	2N3565	.55	FCD820	1.90

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PLENTY OF PARKING AT REAR

STD 02

in Adelaide. I worked VK2BQJ, VK2ZHT, VK2ZJP, VK2ZZI, VK2ZRH, VK1MP (twice), VK1ZAR and VK1ED, and I believe David worked along similar lines. The VK2 signals were up to S7/8 while the VK1 signals were up to S9. My first contact with Reg VK1MP took exactly 12 seconds for us to exchange Ross Hull numbers both ways, so we did not waste any time — no one ever wastes time with unnecessary chatter on a 144 MHz Es opening!

There have been quite a number of openings in other States but as I have no specific details I cannot say much about them. One interesting observation I would like to make is that this season VK1, VK2, VK3, VK4, VK5, VK6 and VK7 have all been worked on 144 MHz SSB from VK5. This would not have been thought possible some years ago, and surely indicates a greater awareness by many operators of the part that 144 MHz plays during the summer 52 MHz DX season, and with increasing numbers of better SSB rigs now coming on the air, this trend must surely increase. There are quite a few operators around Australia who now only require a VK8 for Worked All States on 144 MHz — how long before that can be achieved? And, despite the long distances which can be covered with the nominal 10 watts output of many transceivers, it is still the stations who feed this 10 watts into good linears who take the cream of any opening, and are always worked first, so if the opening is short, the small station operator may miss out — s unfortunate but true!

432 MHz JOTTINGS

The 70 cm band has come in for its own share of long distance contacts, and these too seem to be on the increase. Again very little has come to hand on what has been achieved in other States, but from the angle of the southern States, VK3, VK5 and VK6, the following is a resume of what has happened.

27/12 David VK5KK worked VK6WG, VK6KZ, VK6ZED and VK6ZBW with signals to 5 x 5 . . . About 2030Z Ray VK3ATN peaking to S9 at Keith VK5SV and S6 here at VK5LP . . . Peter VK5ZPS worked Wally VK6WG on 26/12 and 27/12 5 x 4 etc. Roger VK5NY involved also . . . 25/1 Peter VK5ZPS 9 in Albany . . . 29/1 Roger VK5NY worked Les VK3ZBJ, and VK5LP was hearing Les to S2 with carrier running, but no contact made.

1296 MHz RECORD . . see special box.

Looking back, who could but say it had not been a great "DX season". On 52 MHz on 26/12 and 27/12 I worked over 100 stations on that band, and there were plenty of others in other areas who worked considerably more judging from their Ross Hull scores. On 144 MHz we can look at the great area coverages firstly by Es openings, and then some good inversion and ducting openings along the southern coastline. 432 was enjoyed by many again along the southern coastline, while 1296 really opened its heart to provide what is likely to be a world record.

GENERAL NEWS

Dealing with 2 metres, Mac VK2ZMO in his letter is concerned at the possible side effects stemming from the change over of the Newcastle TV station on Channel 5 to 5A. He reports the 144 MHz band is very dead in his area and could be worse still when 5A gets going at full power. Already tests indicate problems with other commercial gear in the same area and grouped around the same transmitting mast. Mac joins with our River and boys in hoping 5A operating will not entirely kill 144 MHz activity as VK5 have a Channel 5A up Luxton way on the Murray.

Doug VK4ADC is the Publicity Officer for the Brisbane VHF Group and advises some details of the UHF beacon in Brisbane, which is a solid state transmitter delivering 8 to 10 watts output through a single cavity filter and via heliax to a clover leaf type aerial to give omni-directional radiation with horizontal polarisation. Frequency at the time of writing was 432 000 MHz and will eventually be changed to 432 400 (which is presently listed at the start of this column . . . 5LP). Location is Wilston Heights on the north side of the city centre and gives coverage to almost all of the greater Brisbane area. Call sign VK4RBB.

Doug also gives details of their repeater VK4RBC which is not yet in operation at its site (time of writing). Solid state Rx/Tx and integrated circuit control logic. Tx delivers 10 watts via filters to 3 dB gain vertical and Rx also fed from separate vertical via filters. Eventually a complete duplexer will be fitted. Channel 352/852 operation. Planned location is Red Hill, just out of centre of the city on northern side. The repeater is expected to be in its final site and in full operation by late March.

Winston VK7EM writes to advise that the north-west Branch 70 cm beacon is off the air until further notice. Almost six months to the day after going into service, the transmitter was damaged when 22 kV power lines fell across the 240 volt-line to the shack. It appears the transmitter has only minor damage, but the wiring inside the hut as well as the switchboard, power points etc. are a charred mess.

Winston remarks however, they were a bit lucky in that the hut and equipment was not totally destroyed as one of the corner studs supporting the fuse box caught fire. All this happened during a wind storm in early December. It may be some time before VK7RTW is back on the air, and advice will be forwarded when again operational.

I note from the pages of the Gold Coast Radio Club Monthly Newsletter that Martin VK4ZIL had more than 1000 contacts in 3 months to January. That's better than 10 a day every day, and apparently the voice is still holding up! Also noted VK4KP having made 2 metre contacts to Bundaberg and MacKay — the latter would be very good at over 400 miles, and indicates the north-south path is not a dead loss!

1296 MHz CONTACT

On 25th February, 1977, at 0100Z, Reg VK5QR in Adelaide contacted Wally VK6WG in Albany on the 1296 MHz band for a two-way QSO. Reg copied Wal who used CW at 547, and Wal gave Reg 5 x 4 for his SSB. Present rough calculations indicate a distance of about 1800 km or 1100 miles, and it seems likely to be a world record.

Equipment used: VK5QR: 1296 mixer without pre-amp, to 28 MHz IF amp. Transmitter used home brew 9 MHz crystal filter, giving a processed 9 MHz signal (QST Oct. 1970) which includes tripling to allow for SSB readability, to 28 MHz, then straight into normal home brew transceiver. Output to 2C39A at 432 MHz at 24W into varactor tripler 10 watts output at 1296. 60 feet of coaxial cable giving about 4 to 5 watts output to a 3 foot dish at 35 feet.

VK6WG: Receiver a Microwave Module converter with pre-amp feeding into FTDX100 transceiver, transmitter being a tripler using a 3CX100A5 with 500 volts on anode at 70 mA, output unknown, fed to 3 foot dish on tower. (Probably about same power at dish as Reg).

Both Reg and Roger VK5NY copied call signs from Wally the previous evening, but were unable to make it for two way contacts. So Roger would really have to be counted as one of the unluckiest people around at the moment!

The amateur fraternity congratulate the operators for this outstanding contact, particularly for Reg to place SSB on 1296. An enormous amount of hard work went into the whole operation, not only at the time, but for much time beforehand by both parties, and when the final details come out, it will rank as a great achievement.

Graham VK6BY after a trip to Victoria confirms former mention of the high level of SSB activity on the lower part of 2 metres in Melbourne, with 144.1 being the calling frequency, and once contact is established then moving to another frequency. He mentions also QRM on 70 cm ATV due to amount of activity, and reports on the excellence of the ATV equipment being used. But after going all that way he found proof of just how isolated VK6 is for general Dx activity on VHF/UHF even with the active VHF Group . . . from VK6 VHF Group Newsletter.

The following table sets out the Terrestrial Two-way Records for VHF/UHF operation and originating in the January 1977 issue of QST.

6 metres: LU3EX — JA6FR, 12,000 miles — 24/3/56.
2 metres: WA6JRA — KH6GRU, 2591 miles — 29/7/73.
1¼ metres: W6NLZ — KH6UK, 2540 miles — 22/6/59.
70 cm: W0DRL — K1PXE, 1210 miles — 16/8/71.
23 cm: K5LLL — K4NTD, 847 miles — 27/1/75
13 cm: G3LQR — OZ9OR, 472 miles — 30/6/76.
9 cm: ZL2WB — ZL2TWI, 278 miles — 2/2/75.
5 cm: W6IFE/K6HIJ/6, 214 miles — 18/6/70.
3 cm: G4BRS — GM3OXX, 324 miles — 14/8/76.
1.25 cm: G3BNL G3EEZ, 96 miles — 14/9/75.

It is interesting to observe the 70 cm record as being 1210 miles. I was of the opinion that for years this had been held by W6NLZ and KH6UK at 2540 miles, in company with similar distances and contacts they accomplished on 144 and 220 MHz. It seems the 70 cm record at that figure may have been disallowed and is presently set at 1210 miles. Notwithstanding however, in the 70 cm Standings List in QST of January 1977 there are no less than 12 stations listed as having worked 2000 miles or more, with W1JAA and K2CBA heading the list with 2670 miles, and three others on 2600 miles. Maybe none of these people have claimed records, but if any of them do they will eclipse the distance set between Les VK3ZBJ and the boys in Albany, which on present actual listings is well above the current world claimed record.

The distance of approximately 1100 miles as recorded in these notes for the 1296 MHz (23 cm) contact between VK5QR and VK6WG will however surely be a world record, if the 847 miles of the present listing are any guide.

A letter has arrived from Ray Clark K5ZMS, No. 1 SMIRK, advising of a 24 hour a day beacon to operate from the north coast of Brittany, France, signing F3THF, operating 50.1 MHz with 100 watts (to be increased to 400/500 or 1 kW if no big interference problems crop up).

Keying FSK, 100 Hz shift, call sign transmitted every 50 seconds. It is to start mid-April to mid-August of this year, and will be repeated during following years if possible. Antenna will be centred on Central America. Any station copying this beacon in VK or ZL in particular are asked to pass on date, time, RST, location and call sign of station receiving it to any US station on any amateur band you can. Ask the US station to pass that info to K5ZMS via phone patch, collect. Landline number is Area code 512 674-5781 . . . nothing seems to be impossible these days on six metres, so you keen Dx operators might look for the beacon, particularly if it gets into the higher power bracket.

Ray also requests me to notify any VK or ZL stations who have worked JA's and collected 3 of their SMIRK numbers to submit details to him, Ray Clark, K5ZMS, 7158 Stone Fence Drive, San Antonio, Texas, 78227. It only requires 3 contacts with foreign SMIRK members. There are now about 18 SMIRK members in Japan, plus HL9WI, a couple of KG6's and Peter VK6ZDY. If in contact with JA stations ask them about a SMIRK number.

In keeping with VK operations on 6 metres which have been very good this year, Ray mentions their 1976 season in the US as being outstanding. Many stations worked their 50th State, Ray worked 7 countries, Canada, Mexico, Caymen Is., Bahamas, Guatamala, Peurto Rico and US. Others also worked YVZZ, PJ2DW, VP2LAW, KH6, 12 JA's worked KH6IJ. He concludes on a note that much Middle East TV was being logged in France. So those 50 MHz signals sure get around. Thanks for the news Ray

Well that's a pretty fair coverage of what has taken place around the countryside for the past month or so. If I go on too far there will be nothing left for next month. I conclude with the thought for the month: "Liberty is always dangerous, but it is the safest thing we have". 73.

The Voice in the Hills

QSP

1977 SUBSCRIPTIONS

Hopefully you have renewed your WIA subscription for 1977 already. For those who have not yet renewed please note that address labels for AR will cease automatically for unfinancials. Missing AR's may not be available after the month of issue because the financial situation does not permit too many "overs" being printed.

FOR AMATEUR EYES ONLY...

Dick Smith always had a soft spot for amateurs. After all, he is one himself — and amateurs helped make the Dick Smith Electronics group what it is today. So he likes to treat the Amateur Radio Department as something special. It is the best stocked (although this is often out of our control!), gives really personal service, and often has the lowest prices of all the departments! So if you want a good deal and good service on amateur gear, try Dick Smith. But don't tell non-amateurs about it — they might get upset to think amateurs are being pampered in this way!

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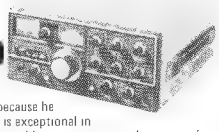
TS-520



Dick would love to give these away — simply because he believes every amateur should own gear which is exceptional in all respects. However, his bank manager has warned him against giving these magnificent Kenwood TS-520s away — keeps muttering something about bankruptcy or something! So Dick must sell them — but only marginally more than what he pays for them! Check the TS-520 out soon — full HF operation on CW, LSB or USB. Ask a ham who owns one — they're good! **Cat D-2520** **$670.00**

Optionals: External VFO, matches the TS-520 perfectly. **Cat D-5201** . .. **$114.00**
External speaker, also matches the TS 520 **Cat D-5202** . .. **$39.50**

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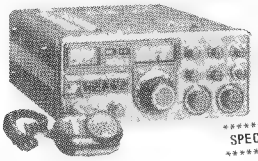

$725 (700)

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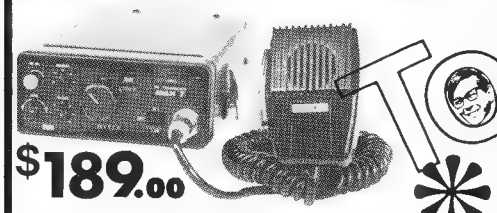
TS-700A all mode transceiver is for 2m operation and is equipped for SSB, FM, AM & CW. 22 channel capability with 11 crystals from 144 - 148MHz. Rugged final stages are fully capable of sustained operation. Noise reflector type squelch circuitry, AC/DC, dual tuning mechanism with panospread. Noise blanker, amplified type AGC circuitry, dependable S meter & built in marker generator.
Cat D 3100 .. .. **$725.00**

TS 600A is for 6m operation. Very similar to the 700A, same facilities. **THE LATEST MODEL!** **Cat D-3106** **$699 00**

MULTI 7: 2m fm value



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SEE REVIEW IN EA. MARCH ISSUE

Fantastic new model DRAKE SSR-1 is an ideal receiver for the most fastidious amateur or the most discerning short wave listener! It's also an ideal professional receiver and monitor. It uses the famous Wadley Loop principle to give continuous coverage from 0.5 - 30MHz in 30 tuneable ranges! Triple conversion receiver, with SSB sensitivity better than 0.3dB for 10dB S+N, N. Dial accuracy is 5kHz! Triple power source, batteries, 12V DC or 240V AC. Aerial impedance 52 ohms. Earlier model in last years catalog was $345: new improved model this year
Cat D 2801 .. .. **$300.00**

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VHF BASE ANTENNA. G6 144.
Deluxe 2 meter colinear for repeater or any fixed station operation. 6 dB gain over a ½ wave dipole. Max mum radiation at the horizon. Shunt fed with DC grounding. Radiator 5/8 wave lower section, ¼ wave phasing, 5/8 wave upper section. Height 117".
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Cat. D-4152.. .. .. **$28.50**
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Cat. D-4158 . .. . **$28 50**
RM 20 Resonator for 20 meters.
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RM 15 Resonator for 15 meters
Cat. D-4162.. .. .. **$23.50**
RM-11 Resonator for 11 meters.
Cat. D-4164.. .. .. **$19.00**
RM-10 Resonator for 10 meters
Cat. D-4166.. .. .. **$19.00**

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Rak antennas from Japan offer quality at budget prices. Dick is pleased to offer Rak antennas to Australian amateurs. Look at these for example:

42S a 1/4 wave for 144MHz, stainless steel whip, 47.5cm high. SWR 1.5:1.
Cat D 4610 .. .. **$8.50**

82S a 5/8 wave for 144MHz, this one is 1.19m high. Handles 200W!
Cat D-4611 .. .. **$11.50**

46S a 1/4 wave for 52MHz, 1.24m high. Comes apart for easy storage.
Cat D-4614 . .. . **$11.50**

ACCESSORIES FOR Rak RANGE

Truck-to-mount — no need to drill any holes and lessen the car value
Cat D-4612 .. .. **$4.50**

Magnetic base holds tight! Has gasket to prevent damage to car body
Cat D-4623 .. .. **$11.50**

Antenna lead assy. for both bases above — PL259; coax & ant. plug.
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GA6020 dual band mobile whip. It's a 5/8 on 144MHz, and a 1/4 on 52MHz. Stainless steel whip, strong, reliable antenna.
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SPECIAL

Magnetic base: Ideal for the GA6020 antenna above; comes complete with coax lead and plug. Instructions supplied.
Cat D-4622 . . . . . **$19.50**

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Cat D 4300 .. .. **$78.00**

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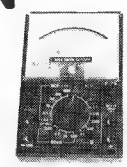
VALUE PACKED MULTIMETER ONLY $22.50



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We know, even if you have — is it any good? The multimeter you bought last decade should be pensioned off! 1000 ohms/volt does tend to load the grid circuit a little! Try one of our brand new model Q 1024 meters: 20k/V, diode protected movement. 20 range (+dB), current up to 500mA DC, voltages up to 1000. Mirror scale for zero error. A bottle er.
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Cat Q 2875 .. .. **$499 00**

BUDGET ROTATOR

$58.90

NEW BUDGET ANTENNA ROTATOR
Primarily intended for TV & FM antennas, but works equally well on small to medium amateur beams (none of your 80 metre yagis, please!). Complete with control box and rotator unit, very simple installation, full instructions supplied. (Alternative — fix the antenna in one post on and rotate the house)
Cat D-5020 .. .. **$58.90**

QSY TO 144 — $275

Want to work 2m with your new TS-520 (the one you've just decided to buy up the top of the left column of this page . . .) We've got the answer! (Haven't we always?) The Kenwood TV 502 — not a new color TV, but a 144-146MHz transverter. It matches perfectly with the TS502, 1uV sensitivity for 10dB S N.
Cat D-3502 .. .. **$275.00**

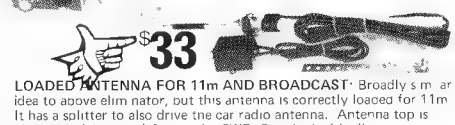
11m MOBILE ACC.

NOVICES & 27 MEGGERS: Dick hasn't forgotten you — look at this little beauty:

27MHz antenna eliminator: Let's face it, most amateurs don't want their cars looking like an antenna farm! Besides, there's always the risk that vandals will make short work of your hours of work — not to mention the cost. The solution: use your existing AM car radio antenna for both broadcast and 27MHz. Gives correct loading and AM radio can be used while transmitting! SWR better than 1.5:1 at edges of 11m band. These won't last long! **Cat D-5516** **$27.00**

$27.00

VALUE!



$33

LOADED ANTENNA FOR 11m AND BROADCAST: Broadly similar idea to above eliminator, but this antenna is correctly loaded for 11m. It has a splitter to also drive the car radio antenna. Antenna top is adjustable (allen key) for precise SWR. Supplied with all hardware, splitter, antenna & lead, plus instructions. Real value antenna!
Cat D 4418 .. .. **$33.00**

MATCHER SPECIAL

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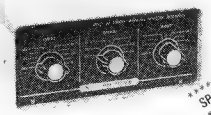

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MATCH YOUR TRANSMITTER INTO ANY ANTENNA: With the deluxe HC-500 antenna coupler, you can run maximum legal power into any load for a 1:1 SWR. Covers all HF (3.5 - 30MHz) bands, takes a 52 ohm input and gives anything from 10 to 600 ohms, balanced or unbalanced. Tune into a piece of wet string! **Special price for this month only** — save $16.50!
Cat D-5500 .. .. **$150.00**

NOVICE TRANSVERT. KIT 89.50

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NOVICES — want to save your hard earned money?
Most novices start out on 11m — simply because the transceivers are cheapest for this band. But most novices want to get onto the quiet 80's as well. The problem — affording it. Here's the answer: the 11-80 metre Novice Transvertor Kit. Takes the output of your 11m rig (AM or SSB) and puts it on the correct section of the 80m band. Very easy kit to build, much, much cheaper than buying a new rig!
Cat K-3134 .. .. **$89.50**

SWLs: a SPECIAL for YOU!

$19.40

SPECIAL

FANTASTIC SPECIAL ON CONVERTORS
Quick for this one: a special on our very popular range of ham band convertors, covering 10-11 metres, 6 metres and 2 metres. They operate from an aerial impedance of 50 - 75 ohms, give 20 - 30dB gain with a noise factor of just 5 - 6dB. Low power (9—12V DC @ 15mA). Ideal for listeners as well as amateurs.

10/11 metre, Cat D-3827 .. .. Special at just $19.40
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2 metre, Cat D-3802 .. .. Special at just $19 40

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To Secret

IONOSPHERIC PREDICTIONS

Len Poynter, VK3ZGP

PREDICTIONS

It would appear that there is sufficient evidence to suggest that the long awaited Cycle 21 is finally starting to evolve. Increasing numbers of the new spots (in the higher latitudes) are appearing and the older cycle 20 spots are slowly disappearing. The 2800 MHz flux measurements are also slowly moving upwards. Daily figures around the 80 are now (in late January) more common and there are significant improvements over many paths on 20 and 15 metres, with 10 metres showing a fair amount of improvement.

One interesting event was late in the evening of December 29, 1976. A magnetic storm of moderate y severe activity commenced at 2037 UTC on December 28th. The first recordings (at 3 hour intervals) were K6, K5, K6, K6 periods 00-03, 03-06, 06-09, 09-12. The results on 21 MHz were quite noticeable in the period 09-12 UTC.

Signals from around Melbourne normally S3-5 were within seconds transformed in S9 + 20-30 dB on S meter scales. Very short skip up to 250 km was very pronounced with up to 1000 km not far behind. The next phase was up to 7000 km into Central Europe with one Maltese station providing plenty of competition to the novice segment of 21 MHz. Things were so hectic below 21.200 MHz that I omitted to listen above to find out what was going on there.

Still later, on January 29, 1977, another storm commencing at 2013 UTC on January 28th had the opposite effect, causing very severe attenuation on signals over a 50 km path across Melbourne for a period of about 10 mins. around 1000 UTC.

Having spent such a large amount of time on 21 MHz I am surprised at the regularity of path openings over the period Oct. onwards. Have now discovered a cycle of openings into Melbourne which the astute amateur can well utilise. The cycle is at this stage reliable for at least 3 out of 4 weeks, though not necessarily in rotation.

For the novice operators, it is proving quite a boom and the occupancy of the portion 21.150-21.200 MHz is very full, often to the complete exclusion of the portion around 21.300 MHz. Some of the more active ones are up around the 40 countries worked with their QRP and often simple antennas.

Summary of 1976 Sunspot Data

Monthly Mean: 1/76 — 8.5; 2/76 — 4.6; 3/76 — 23; 4/76 — 19.5; 5/76 — 12.7; 6/76 — 12.4; 7/76 — 2.1; 8/76 — 16 9; 9/76 — 13.4; 10/76 — 21.8; 11/76 — 5.5; 12/76 — 15.

Running Smoothed Mean: 15.5; 13.4; 12.4; 13.0; 12 7; (9); (7); (9); (9); (9); (8).

Predicted Running Smooth Mean: 1/77 — (9); [illegible] — (8); 3/77 — (8); 4/77 — (8); 5/77 — [illegible] 6/77 — (9).

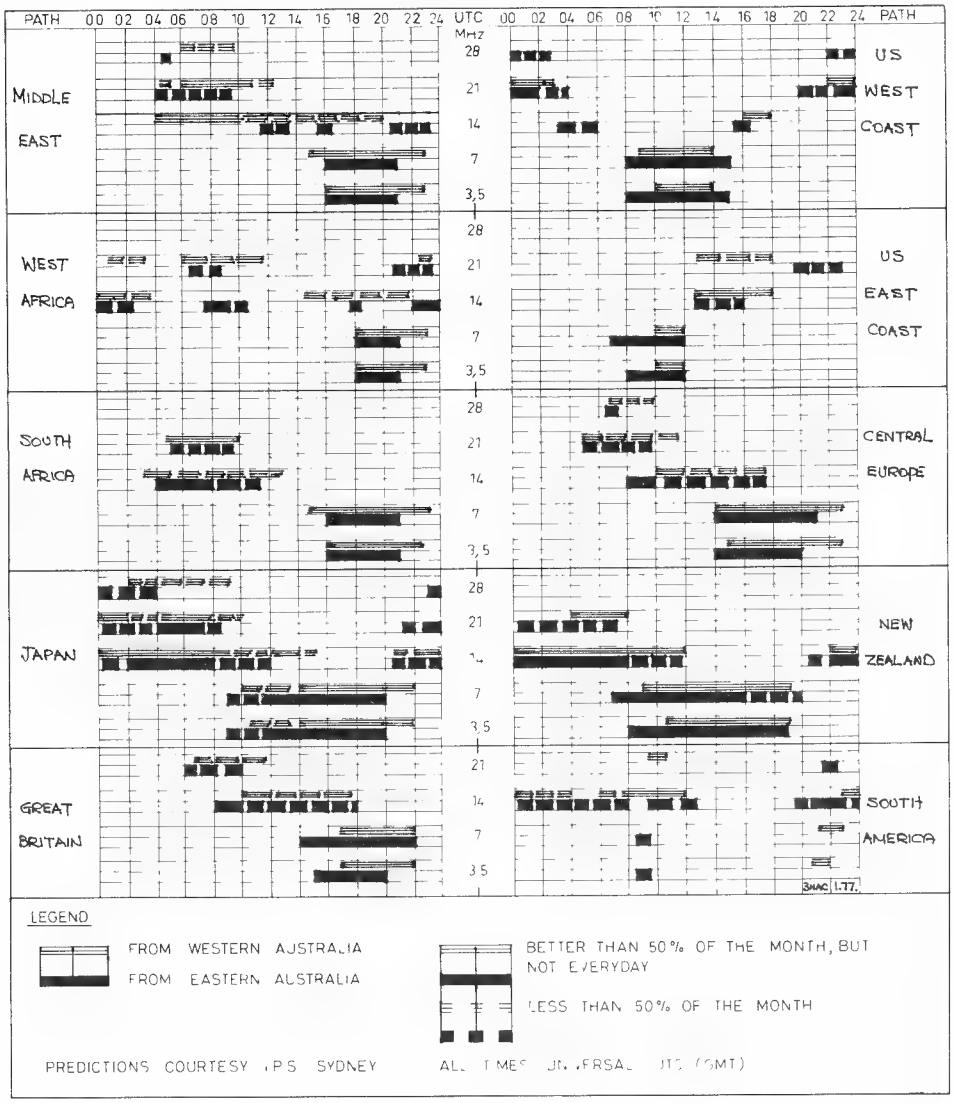
1976 2800 MHz Solar Flux: 1/76 — 74; 2/76 — 70; 3/76 — 77; 4/76 — 76; 5/76 — 71; 6/76 — 71; 7/76 — 67; 8/76 — 75; 9/76 — 73; 10/76 — 76; 11/76 — (77); 12/76 — (79).

Predicted 1977: 1/77 — (81); 2/77 — (82); 3/77 — (83); 4/77 — (84); 5/77 — (83); 6/77 — (82); 7/77 — (82); 8/77 — (83); 9/77 — (85); 10/77 — (88); 11/77 — (90); 12/77 — 92).

On predictions it would appear that to reach the 8 the remainder of the year will have to produce very low activity on a monthly basis through to the end of 1977. Given an average similar to 1976 the running mean might remain somewhere about the 10 mark before lifting off again — providing sunspot activity does in fact improve during 1977.

With a predicted top of 40 for the next two maxima does not raise much enthusiasm from those who worked through the 1958 and 1968 peaks. Guess the newcomers will have to learn a little more about the "tricks of the trade" to fully utilise the higher frequency bands.

Y3's VK3ZGP/NAC ■



LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

The Editor,
Amateur Radio,

Dear Sir,

On behalf of the members and Council of the WIA (S.A. Division) I wish to express deep disappointment at the way in which the results of the 1976 Remembrance Day Contest were published in the December issue of Amateur Radio. The fact that VK5 and VK8 had won the contest was given no mention at all, except in the results table, and that it was our 5th successive win was ignored altogether.

We in the S.A. Division are justly proud of our record in the R.D. Contest, and it is a pity that the publication of the results was done in such a low key manner. Our success does not come by accident but as a result of careful planning and adequate publicity leading up to the contest.

Contrary to some comments heard, the scoring system does not favour us in any way; the secret of our success is the high participation we are able to achieve. VK4 made an effort this year and came very close to toppling us. I hope that next year all Divisions will make a maximum effort and by thus doing help to keep the "R.D." the premier contest on the Australian calendar.

Yours sincerely,
Garry H. Herden VK5ZK, President
(S.A. Division). ■

(Sorry — our slip was showing.—Ed.)

The Editor,
Dear Sir,

We in VK7 have almost become resigned to not ever winning the RD contest again, especially after the selfish attitude of other Divisions disallowed the use of Repeaters by our VHF operators.

The placing of VK6 above VK7 in the 1976 results started a study of the present award score calculation. In the 1976 results VK7 participation was higher than VK6, the top six logs average was higher, average score of all logs was higher, but we ended up 1000 points below in the final calculation. How come?

The calculation of the trophy score is done by adding the average of the top six logs to a bonus calculated by dividing the number of logs entered by number of licences in call area multiplied by total points from all entrants. This last factor can be simplified to average score of all entrants times number of logs submitted. This means that the final result depends on the square of the logs submitted. How can the smaller Divisions ever win? with the same average log scores, to equal VK5, VK7 participation would have had to be 48 per cent and VK1 would have needed 63 per cent.

The problem is, then, this so-called bonus score, which is not a bonus as in the VK5 score it accounts for 92 per cent of final score. A more realistic method would be to derive this bonus by dividing total points by number of licences. This

would remove the square factor of logs submitted and still depend on participation. If we apply this method to the last contest VK4 would have won due to high top six logs with participation only slightly less than VK5. Another possibility would be to allocate points to the various sections — participation, top six logs average, average of all logs, and derive the final result from these points.

It is not my object to derive a new system. This is up to the contest manager. A VK7 agenda item will be submitted to the next Federal Convention that he do this.

P. D. Frith VK7, Federal Councillor. ■

S.A. MICROPROCESSOR GROUP

During the second half of 1976, it became evident from contacts on the 2 metre repeater that a growing number of members of the South Australian Division of the WIA were involved or interested in the amateur applications of microprocessors. In October enthusiasts were invited to attend an informal meeting at the S.A. Division's Headquarters Building in West Thebarton Road and the attendance of 20 people encouraged the formation of a Microprocessor Group. We believe that this is the first such group within the Wireless Institute of Australia.

At the October meeting, it was decided to convene the Group regularly on the second Friday in each month and a small steering committee was elected to start the organisation of meetings and group construction projects. Since then, technical lectures have been held in November (on Numbering Systems by Roger Marks VK5) and in December (on Microprocessor Architecture and Bus Interfacing by Howard Harvey VK5ZBE) while the committee has met to formulate plans for group construction of television terminals, cassette interfaces and standardised microprocessor systems. A constitution has been drawn up for the Group, approved by the Council of the S.A. Division of the WIA, and was adopted by the Group at the December meeting.

Group membership has grown rapidly to just over 50, which has generated interest in its activities within trade circles in Adelaide. The February meeting will consist of the first AGM (hopefully short) followed by a technical lecture and equipment demonstration by the Intel agents, A. J. FERGUSON P'y. Ltd., while the Motorola distributors (Total Electronics) have asked for a similar session with their range of equipment at the May or June meeting. Two other manufacturers agents are also interested in providing technical lectures, which while free of charge to the Group would normally be quite expensive for individuals.

Happily, the Group consists of amateurs with a broad spectrum of interests and knowledge of microprocessor systems, ranging from those who feel that they wish to learn more about this new and exciting field of activity to those who are actively engaged professionally in engineering applications of microprocessors and computers. We are able to draw upon the strengths already existing within our membership for what promises to be a very full programme of meetings in 1977.

In March and April, the Group will hold elementary programming seminars, which with small groups, group tutors and working microprocessor systems will enable a majority of members to gain some hands-on experience of programming and operating. Following further technical lecture meetings, it is proposed to repeat the programing seminars later in the year.

Some critics of the Group have questioned where microprocessors fit into amateur radio activities (which sounds very similar to early criticism of transistors, SSB, RTTY, commercial transceivers, bug-keys, solid-state keyers and any other new-fangled device that makes operating easier or more interesting) but in fact the potential applications of microprocessors by amateurs are limited only by the imagination and ingenuity of the user. The following list of applications is by no means exhaustive, and any amateur who can't think up a couple more should join the Group (if he lives in South Australia) to have his imagination stimulated:—

Silent, static RTTY

Speed and code conversion for RTTY

High speed CW transmission and reception

Antenna tracking for EME and Oscar

Station monitoring and control for SHF meteor-burst comms.

VHF repeater supervision and control

Automatic station contest logging and scoring

SSTV signal processing and caption generation

There are potentially major benefits to members in forming a microprocessor group in shared learning, programming, bulk purchasing and leverage on manufacturers. We would like to think that groups will be formed by other Divisions of the WIA so that the benefits may be shared. If you are interested, have your Divisional Secretary write to the Microprocessor Group, Wireless Institute of Australia, Box 1234 G.P.O. Adelaide, 5001, and we will be pleased to send a copy of our constitution, newsletters, lecture programme and precis notes to help you get started — you will be surprised how many fellow-amateurs will want to join.

S.A. Division members should address enquiries about Group membership to VK5MG or VK5PE. Meetings are held in the Burley Griffin Building (at the rear of the West Thebarton Council Depot) in West Thebarton Road on the second Friday of each month. The February meeting will commence at 7.30 p.m. but other meetings start at 8 p.m. — Clive M. Pearson VK5PE, Box 207, P.O. Gawler, 5118. ■

INTRUDER WATCH

Alf Chandler, VK3LC

1536 High Street, Glen Iris, 3146

Further to my previous reports regarding the pulse transmissions so well documented by our Obervers over the past few months I quote two sources of information and hope that this will be the last time I have to talk about this interference.

The following quotation was received from K6KA, and was sent by telex from Moscow to the FCC — "Radio installations operated in the high frequency bands are being experimented with in the Soviet Union, and these experiments could possibly cause interference of short duration to your radio facilities. We are now taking action in order to decrease the eventual interference. Your **reports** (my underline) will be attentively studied by Military or Postal Telecommunications of the USSR". What an understatement!

On the same subject I quote from "Radio Communication" of January, 1977 — "The powerful interference from the USSR noted previously has, at the time of writing, become less frequent in appearance but has not yet ceased. The signal caused a half-page report in the "Washington Star" which was picked up by most of the USA press outlets. This report extensively quoted the IARUMS co-ordinator. Feedback from the Home Office following reports by the RSGB Intruder Watch organiser, shows that telex messages have been sent to the USSR, China and Egypt asking for the cessation of interference in exclusive amateur bands In several cases the USSR based interference has ceased but there has been no success following representations at Peking. In addition to its primary function, the Intruder Watch is a source of valuable information which is being prepared for WARC 1979. Any administration unwise enough to refer to the 7 MHz band as an exclusive amateur service allocation can be given an answer backed by facts and evidence".

As well as the USA and European countries, that is Region 2 and Region 1, we in Region 3 have systematically reported this QRM as well as other types of interference, notably broadcasting in the 7 MHz band, but we still need more Observers. I don't know why I have to re-iterate this plea so often. It baffles me completely why so many members will not take just a few minutes occasionally to scan the bands for intruders, or at least, when they hear an intruder, not report the occurrence to their appropriate co-ordinator. Is it apathy or just plain forgetfulness? ■

PROJECT AUSTRALIS

David Hull, VK3ZDH

NEW SATELLITES

Approximate launch dates have been announced for the next breed of Amateur satellites. AOD is another low altitude satellite designed to provide continuation of the ARRL Education program which is used as the justification for so much of AMSAT's funds. It will have a period of 102 mins and inclination of 99° and a 915 km apogee. It may fly as early as June 1977 but will probably be launched in the latter half of the year. The first of the phase 3 elliptical orbit satellites should fly from the European Test Range in French Guiana aboard the second test flight of the ESRO "Ariene" satellite in December 1979. Another intriguing possibility is the chance of a ride aboard a geostationary satellite over the south Pacific. More on this as details come to hand.

PROBLEMS

AO7 experienced a period of mode switching over the Christmas-New Year period attributed to climatic conditions in the northern hemisphere. Bob Arnold VK3ZBB reports that it seems to have settled down since this period. It is hoped that this "disease" was only temporary.

Of a more serious nature we have noticed a change for the worse in the condition of AO6's battery. Telemetry indicates that one of the Nicad cells in the upper half of the battery has failed and is not accepting charge as well as it should. This has meant a more tighter control over the on/off cycle and the bird has had to be switched "off" occasionally when it should be "on". Apologies for any inconvenience.

APRIL 1977

OSCAR 6				OSCAR 7			
Date	Orbit No.	Time Z	Long °W	Date	Orbit No.	Time	Long °W
1	20391	01.22	80.80	1	10866	00.52	65.99
2	20403	00.22	65.80	2	10879	01.47	79.61
3	20416	01.17	79.55	3	10891	00.46	64.49
4	20428	00.17	64.55	4	10904	01.40	78.11
5	20441	01.12	78 30	5	10916	00.39	62.99
6	20453	00.12	63.30	6	10929	01.34	76.61
7	20466	01.07	77.05	7	10941	00.33	61.49
8	20478	00 07	62.05	8	10954	01.27	75.11
9	20491	01.02	75.80	9	10966	00.27	59 99
10	20503	00.02	60.80	10	10979	01.21	73.61
11	20516	00.56	74 55	11	10991	00.20	58.49
12	20529	01.51	88.30	12	11004	01.15	72.11
13	20541	00.51	73.30	13	11016	00.14	56.99
14	20554	01.46	87.05	14	11029	01.08	[illegible]
15	20566	00.46	72.05	15	11041	00.07	5[illegible]
16	20579	01.41	85.80	16	11054	01.02	69.11
17	20591	00.41	70.80	17	11066	00.01	53.99
18	20604	01.36	84.55	18	11079	00.55	67.61
19	20616	00.36	69.55	19	11092	01.50	81.23
20	20629	01 31	83.30	20	11104	00.49	66.11
21	20641	00.31	68.30	21	11117	01.43	79 73
22	20654	01.26	82.05	22	11129	00.43	64.61
23	20666	00 26	67.05	23	11142	01.37	78.23
24	20679	01.21	80.80	24	11154	00.36	63.11
25	20691	00.20	65.80	25	11167	01.30	76.73
26	20704	01.15	79.55	26	11179	00.30	61.61
27	20716	00.15	64 55	27	11192	01.24	75.23
28	20729	01.10	78.30	28	11204	00 23	60.11
29	20741	00.10	63.30	29	11217	01.18	73.73
30	20754	01.05	77.05	30	11229	00.17	58.61

COMMONWEALTH CONTEST 1977

A reminder is given that this contest will run from 1200Z Saturday, 12th March, to 1200Z Sunday, 13th March 1977.

Rules are as published in last month's AR. There are medallions to be won by the VK winner and VK middle placing.

CONTESTS

Kevin Phillips, VK3AUQ
Box 67, East Melbourne, 3002

CONTEST CALENDAR

March

5/6	ARRL DX Phone contest
5/6	YL-OM CW contest
12/13	RSGB Commonwealth contest CW
12/13	South Dakota QSO party
12/14	Virginia QSO party
19/20	ARRL DX CW contest
26/27	CQ WW WPX SSB contest
26/27	BARTG Spring RTTY

April

2/3	Polish "SP" CW contest
2/4	ARCI QRP contest
12/13	DX YL to W/VE YL CW
16/17	Bermuda contest
16/17	Polish "SP" Phone contest
16/17	ARRL CD CW party
16/17	Florida QSO party
23/24	ARRL CD phone party
23/24	PACC DX contest
23/24	Swiss "H-22" contest
26/27	DX YL to W/VE YL phone

Commonwealth Contest
Starts 1200 GMT March 12 and finishes 1200 GMT March 13. Eligibility is limited to RSGB residents the UK and amateurs licensed to operate within British Commonwealth or British Mandate Territories. Activity is on CW only, in the lower 30 kHz of each band. Exchange signal report only. Each QSO is worth 5 points, with a bonus of 20 points for the first 3 contacts with each Commonwealth area.

Send logs to D. J. Andrews G3MXJ, 18 Downview Crescent, Uckfield, Sussex, England. Logs to be received by May 16 to be eligible.

CQ WW WPX SSB Contest
Starts 0000 GMT March 26 and finishes 2400 GMT March 27.

Contacts between stations on different continents count 3 points on 14, 21 and 28 MHz, and 6 points on 7, 3.5 and 1.8 MHz. Contacts are permitted between stations in the same country for the purpose of obtaining a Prefix multiplier, but have no QSO point value. The multiplier is the number of Prefixes worked. Each Prefix may be claimed only once, not once per band.

Exchange RS report and a serial number starting at 001. Only 30 hours may be claimed for scoring. The 18 hours of non operation may be taken in up to 5 periods. This is for single operators, who must show at least 12 hours operation to be eligible for awards. Multi operator stations must show at least 24 hours, with no time limit.

Mailing deadline is May 10th. Logs to go to CQ WPX SSB Contest Committee, 14 Vanderver Ave., Port Washington, N.Y. 11050 USA.

Dash DX Contest
CW — April 2/3, and Phone on April 16/17. Starts 1500 GMT Saturday and finishes at 2400 GMT on Sunday.

This year's contest has a few changes from past years. The contest is now on two weekends Phone and CW, each independent of each other. The districts (Powiats) have been replaced by 49 Provinces (Wojewodztwo). The new abbreviation, two letters denoting the WOJ, will be sent in the exchange.

Exchange RS(T) and a 3 figure serial number starting at 001. Polish stations will send RS(T) and their WOJ, i.e. 579KA etc. Each QSO with an SP/SQ/3Z counts 3 points. Each different province (WOJ) worked counts as a multiplier, but can only be claimed once, regardless of the number of bands used. (Maximum of 49).

Final score is the total QSO points times the number of Provinces worked. The same station may be worked on each band for QSO points, but only once for the WOJ.

Certificates will be awarded to the top scorers in each category and mode (i.e. single operator single and all band, Multi operator all band only, and SWL) in each country and each call area of Australia, Canada, USA and USSR.

Use a separate sheet for each band, and a summary sheet showing scoring, and your name and address in block letters. The usual signed declaration is requested.

Entries must be postmarked no later than April 30 for CW and May 15 for Phone, and go to PZK Contest Committee, P.O. Box 320, 00-950 Warszawa, Poland.

ARCI QRP Party
Starts 2000 GMT April 2, and finishes 0200 April 4. This contest is sponsored by the QRP Amateur Radio Club International, and this activity is open to all Amateurs. Stations may be worked once per band for QSO and multiplier credit. Exchange RS(T) and state, province or country. Members will include their QRP number, non members their power input. Contacts with a member count 3 points, and non members count 2 points. Stations other than W/VE 4 points. Each State, province or country worked on each band counts as a multiplier. There is also a power multiplier as follows: Over 100 watts input — x 1; 25 to 100 watts, x 1.5; 5 to 25 watts x 2; 1 to 5 watts x 3 and less than 1 watt x 5.

Final score is QSO points x States, provinces and countries per band x the power multiplier. Frequencies CW — 3540, 7040, 14065, 21040, 28040. SSB — 3855, 7260, 14260, 28600 (21360?). Include a summary sheet with your entry with a breakdown of scoring, bands used, equipment, antennas and power used. Your name and address in block letters and the usual signed declaration. Logs must be received before May 30 and go to E. V. "Sandy" Blaize, W5TVW, 417 Ridgewood Drive, Metairie, LA 70001. ■

20 YEARS AGO

Ron Fisher, VK3OM

The first transistorised transmitter to be featured in Amateur Radio was described by Hans Albrecht, VK3AHH, in the March 1957 issue. Perhaps the term "transmitter" might have been a little ambitious as the unit was little more than an oscillator built into a match box. Hans claimed an output of 1.65 milliwatts. It was however a starting point. In a second article in the same issue, Hans described his experiments stabilising transistor oscillators.

"Meet Donald Duck" by Stan Bourke was not a description of a guided tour of Disney Land but an introduction to the benefits of single sideband. While SSB activity was slowly increasing, most of the big AM boys were still sure it was just a passing fad.

Television DX reception made big news in the newspapers of those days especially when the BBC (London) was received by two SWL's. In Sydney, Norm Burton received the sound carrier on 41.5 MHz with his modified SX 28 receiver. George Palmer of Melbourne also heard the sound carrier on both an English TV receiver and also with a converter into a communications receiver. In both cases no picture was received. A low power transmitter or exciter for two metres using a 6V6/6V6/6BW6 driving a 2E26 in the final designed by K. Mitchelhill, VK2ANU, was also featured in March 1957 Amateur Radio.

Other articles were, "Combining 6V and 12V Filament Operation" by W. Howse, VK6ZAA, and "A Suggested New Reception Report System" by YO3RD. It seems that most reporting systems evolve rather than just appear and it would appear that YO3RD's system has disappeared.

"Subdue That Over-Modulation and Increase Your Readability" or how to apply negative peak clipping to an AM transmitter. Bud Pounsett VK2AQJ showed you how to do it. The Federal Executive Editorial page told readers just how a Federal Convention is arranged. With a Convention due to be held in Melbourne the following month, they no doubt hoped to raise more interest and support for this. ■

LARA

Ladies Amateur Radio Association

"DOINGS AND WANDERINGS"

For this month, we will take a look at the activities of some LARA members over the summer. Wanderings include Norma VK3AYL who set off for a glorious holiday in New Zealand in December and hasn't been heard of since. She is meeting some members of WARO on her travels and has probably joined in their skeds. YL activity in ZL is quite widespread and WARO membership lists include a large number of licensed YL's.

So much for the international scene. If Norma hasn't fallen into a fjord or off a volcano we expect to see her back to teach the novice classes in the new term. Interstate travels include Myrna VK5YW, who visited VK3 in late January. She met some of the VK3 LARA members who know her as the net controller on the LARA skeds. Unfortunately there wasn't time to organise a formal meeting for the occasion.

Doings amongst members over the month of course include that enthralling activity exam-sitting. Some of us enjoy this so much that we do it again and again. Anyway, best of luck for those awaiting results this time.

Doings on the organisational side in the month have included steps towards the first 1977 newsletter edition. Contributions from members will, of course, be warmly welcomed. Members are asked to return copies of the referendum in the last edition, as a vote in the national "meeting".

A list of coming events is a possibility in the newsletter if people will let us know when, what and where.

Finally, mention should be made of all the doings and wanderings of members locally in each area. Most of us are quite busy enough and it is always a shock to find another month going each time a meeting comes around, but not to worry, just come up on the sked and share your troubles.

33's LARA ■

AWARDS COLUMN

Brian Austin, VK5CA
P.O. Box 7A, Crafers SA, 5152

WAB AWARD (BERMUDA)

1. The award is available to licensed amateurs.
2. QSL cards must be submitted with the application.
3. There is no fee.
4. Address for applicants is —

   Awards Manager,
   Radio Society of Bermuda,
   Post Box 275.
   Hamilton, Bermuda.

Rules: Contacts made during the annual Bermuda contest may be claimed for credit without submission of QSL cards provided that —

1. the applicant has submitted a valid contest log, and
2. application is made within one year of the contest.

Only one mobile or portable station may be claimed for credit.

The city of Hamilton is in Pembroke Parish and **not** Hamilton Parish.

Requirements: One confirmed contact is required with each of the nine Parishes.

1977 CAPE TOWN FESTIVAL AWARD
The award is available to all licensed amateurs. Contacts must be made during the period 0000 SAST 2nd April 1977 to 2400 SAST 30th April 1977 (2200 GMT 1st April - 2200 30th April). Stations are required to work ZS1CTF or ZS1CTM plus 2 other ZS1 stations. QSL cards are not required for this award. Submit an extract of your log certified as being correct by either your local awards manager, or two licensed amateurs. Any mode or combination of modes may be used. Any band or combinations of bands may be used. Closing date for applications is 31st July 1977. Certificates will be posted after this date only. Fee for the award is SA Rand 1.00 or US$2.00. A special endorsement will be aavilable for VHF contacts. This may be applied for as an additional award. Applications should be addressed to

Derek Siegel ZS1DP,
SARL CT Branch,
P.O. Box 5100,
Cape Town 8000, South Africa. ■

QSP

NEW PREFIX

The ITU announe the provisional allocation of the callsign series S8AA—S8ZZ to the Transkei in response to a request by the Republic of S. Africa. Radio Communication January '77.

BEACONS

It is interesting to note the beacon situation in the UK as published in Radio Communication (November '76) and IARU Region 1 News. The listings show the following:—

Band	Number	Remarks
28 MHz	1	GB3SX
	7	rest of world; 28.165 MHz to 28.195 MHz
70 MHz	2	in G land*
144 MHz	4	in G land*
432 MHz	2	in G land*
1296 MHz	1	in G land*
		2 G licensed
2300 MHz	1	licensed in G.
3456 MHz	1	licensed in G.
10 GHz	2	in G land* plus 1 licensed

* Means operational.

HAMADS

- Eight lines free to all WIA members. $9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Commercial advertising is excluded.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

FOR SALE

Shack Cleanout: HRO, six coil sets 480 kHz to 40 MHz; VFO 3.4-3.7 MHz; Command Rx 3-6 and 6-9.1 MHz; Tx 3-4 and 4.5-5.3 MHz; R1124A Rx; Bendix TA12 Tx; BC625A VHF Rx; Xtal cal. No. 10; metrix 742 VTVM CW VHF probe, Palec VCT; Loran APN4 Rx and indicator; relays 12, 24, 48, 240 volt; many other components incl. VAR caps etc. Best offers accepted. VK3ASC, QTHR (03) 45 3002 (priv.), (03) 698 5393 (bus.).

Lafayette KT320, general coverage Rx with manual, goes well, $60. Ken KP202, hand-held 2 m transceiver with repeaters 2, 6 and 8. Simplex "A" 40 and 50. Nicads and charger, manual, $140. All offers considered, VK3BAX, QTHR. Ph. (052) 9 5949 bus., (052) 9 7401 A.H.

Estate late VK2YB. Hansen TV circuit tester, capable of 700 AC/DC V, 17,500 V EHT, mA, resistance, output meter, capacitance, inductance, RF indicator, tube GM test and transistor testing etc. $15, plus any delivery cost. Contact VK2QL, QTHR.

AWA 1.25 KVA auto 240 V line transformer, $10 plus freight. Power transformer 220/260 V input 1250 V output tapped at 600, 750, 1000 V rated at 250 mA, $10 plus freight. Core held by ¾ angle iron and bolted. AR7 dial and ganged condensors. Best offer. VK2QL, QTHR.

Microwave Dish Aerials: 3 ft. diameter, aluminium mesh construction, with centre feed mounting, commercial manufacture, good condition, ideal for Dx or satellite reception, $30 or offer. R. Brown, Sydney, Ph. (02) 638 2880.

FT 200 with home made PS, speaker, all 10 m xtls in working order, but may be improved by tuning, $295. MFJ Super Logarithmic Speech Processor LSP 520 BX, see QST, $49. VK2BMI, QTHR. Ph. (02) 771 1657 A.H.

Two Barlow Wadley Rx under warranty. One faulty, $175, the other $200. D. Deerman, 222 Parry Street, Charlesville, Qld., 4470.

Teletype ASR 35, heavy duty model, ASCII, in exc. cond., with all manuals, service log, tape and paper, $365. Icom IC20, exc. cond., ch. 2, 6, 8 rep. and ch. 40 and 50 simplex, $130. Asahi 5/8th 2 m whip and car mount $15. Simon Rosenbaum VK3ZUI, Ph. (03) 51 1156 A.H.

Morse Cassettes: C60's with ITU standard speeds, 5, 6, 7, 8, 9, 10, 11, 12 words per minute, practice before exams to (past exam) standards. Contact Peter Dodd, Fed. Exec. Office.

Cubical Quad 7'9" boom, 1" wood dowel spreaders. Can be used to make a 144 MHz "BL mini-quad" or supply details to copy high gain 3 band quad. Any reasonable offer near $40. Graeme VK3ZR, A.H. (03) 89 4645.

Atlas 180, mike, 2 batt. leads, little used $A360. G whip helical 10 thru 80, $60. 2 m FM digital II, VK version, as new, $260. P29KE, Box 840, Rabaul, PNG.

Heath SB500: 2 metre SSB transverter, 140 W PEP 2 x 6145B's with 10m input/output, $175, like new condition, had very little use. Poly-comm 2 144-148 AM tunable transceiver with inbuilt separate Tx and Rx VFO's and super sensitive Rx with squelch, effective NL. Tx easily convertable to FM, Rx copies FM FB. Inbuilt AC/DC power supplies, $135. VK3BGW, L. Kubis, QTHR, Ph. (03) 561 3555 (bus.) (03) 232 6528 (A.H.).

FT101 10 to 160 m, KP202 with nicads, charger and crystals, RPT 2, 4, 6, 8, ch. 40, 50 and manual. Offers to VK3LV, QTHR.

WANTED

For 4CX250 Linears, blowers, sockets and chimneys, items to make up 3 sets for VHF. VK7MC, P.O. Box 52, Sorell, Tas., 7172.

Compact Linear Amp, 400 W PEP for HF Dx bands, in good order. For details and price to Graeme VK3ZR, A.H. 89 4645.

80-10 m Transmitter or transceiver, good condition, 12 V DC operation essential, 240 AC desirable. VKZBL, QTHR. Ph. (062) 81 6845.

144 MHz/28 MHz Transverter, valve or solid state. 432 MHz-1296 MHz equipment, must be GWO, reasonable price please. Help a VHF nut to get back on the air! VK3AWD, 32 Lackenheath Drive, Tullamarine, 3043. Ph. (03) 338 8475.

Set of Coils for Lafayette GDO, model TE-18, VK2NBE, 2/10 Bligh St., Wollongong, N.S.W., 2500.

Amateur making comeback urgently wants SSB transmitter or SSB transceiver. Yaesu, Kenwood, Drake, Swan, Collins! What have you? Pay good price for good gear. VK2RW, Box 87, St. Ives, 2075 or Ph. (02) 44 7701.

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★ ITU Standards

★ Machine Produced

★ Service to Members

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TAPE No. 2: Follow up at 6 to 10 wpm.

TAPE No. 3: Texts at 10 wpm, Exams at 12 & 14 wpm

EACH ON C60 CASSETTES

Price **$3.95** each Post paid or **$11.00** for all three.

Write to

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P.O. Box 150, Toorak, Vic. 3142

SILENT KEYS

It is with deep regret that we record the passing of —

Mr. C. CASE — **VK3ACE**
Mr. C. R. McNALLY — **VK3CE**

IVOR MORGAN — VK3DH

January 4th 1977 was a sad day for the radio fraternity when it learned of the sudden death at his home of one of Australia's best known and popular amateurs — Ivor Morgan VK3DH.

Although officially retired, Ivor was still working at the HSV-7 transmitter on relieving duties with no hint of any trouble. He had, in fact, taken part in the regular mid-morning chat on 7 MHz with his radio friends and after sign off had come in to have a cup of tea with his wife when he collapsed.

Ivor operated a superb station with a complete Collins "S" line on all HF bands, even his car was equipped with an Atlas 210 mobile set which he used extensively whilst travelling to and from the HSV transmitter on Mt. Dandenong.

VK3DH was well known for activities associated with the Pacific DX net on 20 metres as well as taking the call-back after the WIA broadcasts on Sunday mornings on 3.6 MHz. Ivor was a Vic-Div WIA councillor and liaison member with Community Radio 3CR. As secretary of the "Old Timers" association, he was busy with the final arrangements for the annual dinner to be held on March 10th.

Ivor was never idle, radio was his livelihood as well as his hobby and he had a stream of friends and others seeking his advice which was always so freely given.

VK3DH was first licensed in March 1930 and commenced transmission in the then popular 200 metre band with experimental musical broadcasts on Sundays. Even as a schoolboy, Ivor acquired an interest in radio and constructed his own equipment. His first job was in the radio department of a large store in Melbourne and he followed that vocation ever since, having his own shop at one stage.

As commercial broadcasting developed, Ivor took a keen interest in this field and obtained his Broadcast Operator's Certificate in 1936 and worked with Ray Shortell (3SR) on the installation of a new transmitter at 3SR Shepparton. He subsequently joined 3AW in Melbourne and was A/g Chief Engineer during the war period. With the advent of television he obtained his Television Operator's certificate and joined HSV where he worked until the end. The Radio World has lost a virile and enthusiastic member and was represented by a very large gathering at St. John's Church of England, Camberwell, in a tribute to Ivor's wife, Ilse, and two sons, Vincent and Christopher.

Alf Kerr VK3JQ.

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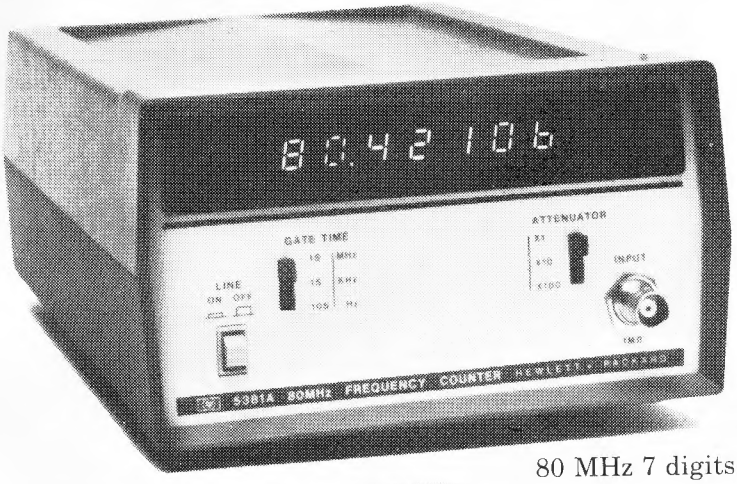

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